ERCB Energy Resources Conservation Board

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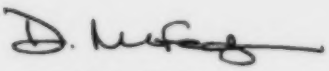
Directive 071

Revised edition November 18, 2008

Emergency Preparedness and Response Requirements for the Petroleum Industry

The Energy Resources Conservation Board (ERCB/Board) has approved this directive on November 18, 2008.



Dan McFadyen
Chairman

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1 Introduction

1.1 What's New in This Edition

The November 2008 edition of *Directive 071* updates and replaces the July 2008 edition. It includes updates and clarifications, including those resulting from stakeholder feedback. A summary of the changes in this edition of *Directive 071* is in Appendix 10.

1.2 Overview

The Energy Resources Conservation Board (ERCB) has a stringent regulatory framework that is governed by principles aimed at protecting the public and environment from harm through responsible petroleum operations. These principles are embodied in the many ERCB directives that together form the components of the Emergency Management System—**prevention, mitigation, surveillance and enforcement, and investigation.**

Directive 071: Emergency Preparedness and Response Requirements for the Petroleum Industry[1] supports the following three core principles:

1) The ERCB regulatory system ensures that appropriate emergency response plans (ERPs) are in place to respond to incidents that present significant hazards to the public and the environment.

2) The ERCB regulatory system ensures that there is an effective level of preparedness to implement ERPs.

3) The ERCB regulatory system ensures that there is the capability in terms of trained personnel and equipment to carry out an effective emergency response to incidents.

Principle 1 aims to determine what could go wrong, who could be impacted, and who needs to be involved (e.g., industry, local authorities). Principle 2 aims to determine what resources and training are needed. Principle 3 aims to ensure that the capability exists to respond during a real incident.

Whereas Principles 1 and 2 are important to increase the likelihood of appropriate response, Principle 3 focuses on achieving public safety through action during a specific incident. Capability to respond is a priority and will be tested through the ERCB Emergency Response (ER) Assessment Program.

The ERCB has adopted the most recent edition of the Canadian Standards Association (CSA) *CAN/CSA-Z-731-03: Emergency Preparedness and Response* and expects it to be used by the petroleum industry in conjunction with *Directive 071* for the development of emergency preparedness and response programs.

Directive 071 is divided into two parts:

Part A provides the planning requirements for ERP development that licensees are required to meet in order to gain ERCB approval for the ERP. Part A also contains the requirements for a corporate-level ERP.

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[1] "Petroleum industry" within the context of this directive refers to petroleum industry operations that fall under *Directive 056: Energy Development Applications and Schedules*.

Part B provides the requirements that licensees are required to meet in order to effectively implement their plans and respond to an emergency. Part B will be assessed through the ERCB's ER Assessment Program, exercise involvement, post-incident investigations, and field inspections.

1.3 Licensee Responsibility

Licensees have a responsibility to ensure that they are fully prepared and capable of responding to any level of emergency. Emergency preparedness and response includes all activities done prior to an emergency so that designated personnel are ready and able to respond quickly and appropriately, as well as those activities that take place during the incident. This includes activities such as

- identifying hazards,
- preparing and maintaining ERPs and response procedures,
- ensuring that the ERPs identify sufficient resources and equipment for use by response personnel during an emergency, and
- designating response personnel and ensuring that they are suitably equipped to carry out their duties through training, drills, and exercises.

1.4 Requirements, Enforcement, and Expectations

ERCB requirements are numbered sequentially within each section of *Directive 071*. "Must" indicates a requirement, while "expects," "should," and "is encouraged" indicates a recommended practice or guideline that is not subject to enforcement action but that should be given consideration by the licensee.

The ERCB's enforcement process is detailed in *Directive 019: ERCB Compliance Assurance—Enforcement*.

During audits, inspections, and investigations, the ERCB identifies noncompliances with *Directive 071*, tracks them in a number of ERCB compliance categories, and takes enforcement action.

1) The licensee must provide information as requested by the ERCB for any audit, inspection, or investigation, including the Emergency Response (ER) Assessment Program.

1.5 Purpose of Emergency Preparedness and Response

The purpose of emergency preparedness and response is to establish a decision framework and action plan so that the licensee can quickly and effectively respond to an emergency. The overall goal is to protect public safety and minimize impacts to the environment through implementation of an ERP.

An ERP is a document that provides quick access to critical information necessary to effectively respond to an emergency and is a key component of emergency preparedness and response. The type and amount of information contained within an ERP is determined by the potential hazard(s) identified. An ERP addresses emergency scenarios, potential hazards to the public, and systems required for effective response.

An ERP

- is organized and prioritized to provide quick access to critical information;
- is used to coordinate activities among industry responders, emergency services, local authorities, Regional Health Authorities (RHAs), government departments and agencies, and others that have a role in providing an effective response;
- promotes communication with all persons involved in or potentially affected by the emergency;
- assists personnel in determining and performing remedial actions;
- clearly establishes roles and responsibilities of all responders;
- identifies response organizations and describes command and control structures; and
- identifies and describes predetermined resources, required personnel, equipment, and services.

1.6 *Directive 071* Requirements

Directive 071 derives its authority from the *Oil and Gas Conservation Regulations*, pursuant to the *Oil and Gas Conservation Act*, and the *Pipeline Regulation*, pursuant to the *Pipeline Act*. Licensees are required to register their ERPs through the Digital Data Submission (DDS) system using the same business associate code that was used for the registration of their *Directive 056* application, subject to eligibility requirements.

1.7 ERP Application Process for ERCB Approval

Licensees are required to use the application form found in Appendix 2 to apply for approval of an ERP. Responses to questions on the form will determine whether the application is considered routine or nonroutine. Applications may be audited and if found to be noncompliant, the applicant will be subject to enforcement action.

In the case of significant deficiencies, the ERCB Emergency Planning and Assessment (EPA) Section will notify the applicant in writing that the application is being closed and the reason for the closure. Closed ERP applications are not returned to the applicant. The applicant may reapply by submitting a new, complete, and accurate ERP to the EPA Section.

Significant deficiencies that make the ERP technically incomplete include, but are not limited to, the applicant

- failing to appropriately address and/or explain the selected bold boxes marked on the ERP Approval Application form,
- failing to respond to ERCB requests for additional information within 10 business days of receiving request, or
- providing information within the ERP that is inconsistent with the information contained within a related *Directive 056* application/licence.

If the applicant designates a consultant to prepare and file an application on its behalf, EPA staff may communicate with the consultant during the processing of the ERP application.

1.8 Continuous Improvement

The EPA Section gathers information on the efficiency and effectiveness of *Directive 071* through application auditing, data retention activities, and the ER Assessment Program, as well as by soliciting feedback from stakeholders.

As part of this commitment to continuous improvement, the EPA Section anticipates the evolution of the procedures described in *Directive 071* in order to meet and exceed the needs of all stakeholders.

Part A: Planning Requirements for *Directive 071*

2 Corporate-level ERPs

2.1 Corporate-level ERP Requirements

Site-specific ERPs are not required for every drilling, production, or pipeline operation in the province. When a site-specific ERP is not required, a corporate-level ERP is used by the licensee to handle emergency events.

1) The licensee must have a corporate-level ERP with preplanned procedures that will aid in effective response to an emergency.

   The licensee is expected to determine the level of detail required to address each item in a corporate-level ERP based on the hazards and potential consequences of the emergency scenarios that its operations pose to the public and/or environment and to keep the plans current. Corporate-level ERPs do not require ERCB approval; however, the ERCB may request that they be submitted for review.

2) As a minimum, the licensee must include the following information in its ERP:
   - key licensee contacts,
   - a 24-hour licensee emergency contact telephone number,
   - a method of classifying incidents and response actions for specific incidents,
   - a communications plan that addresses
     - communication with response team, support services, and government,
     - communication with the public and media, and
     - downgrading and stand-down of emergency levels,
   - responsibilities of personnel required to respond to an emergency,
   - establishment of incident management systems, and
   - activation of a reception centre.

3) The licensee must ensure that a call to its 24-hour emergency telephone number initiates immediate action.

4) The licensee must ensure that its 24-hour emergency telephone number is posted by way of a conspicuous sign erected at the primary entrance to all licensee wells and facilities.

2.1.1 Assessment Matrix for Classifying Incidents

The ERCB has developed an assessment matrix so that incidents can be classified and communicated to others by industry, local authorities, RHAs, and government agencies in a consistent manner throughout the province.

5) The licensee must include all the information in Appendix 4 in its corporate-level ERP.

6) The licensee must define appropriate actions, including public protection measures, that would be taken for each level of emergency.

2.1.2 Communications Planning

The development and implementation of an effective communications plan is essential to emergency response.

7) In its corporate-level ERP, the licensee must

- describe its procedures for contacting and maintaining communication with key licensee personnel, government agencies, support services, members of the public, and the media;
- clearly define the responsibility to contact the ERCB and other responders in the event of an emergency; the ERCB recommends that a communications flow chart be included in the ERP, identifying responsibilities by role;
- describe procedures that will be implemented during an incident to contact and maintain communication with directly impacted members of the public in order to keep them informed of the situation and the actions being taken; this includes plans for communicating the implementation of public protection measures, such as evacuation and sheltering in place for residents;
- describe procedures that will be used to inform and update the media and procedures in getting factual messages out to the public at large in an expeditious manner; and
- describe procedures to downgrade and stand-down levels of emergency.

2.1.3 Responsibilities of Personnel

8) The licensee must identify the roles and responsibilities of personnel required to effectively respond to an emergency. One or more functions can be assigned to an individual depending on the complexity of the potential response to an emergency.

2.1.4 Incident Management Systems

9) In its corporate-level ERP, the licensee must

- describe how it will manage and coordinate a response to an emergency, and
- address the roles and responsibilities of personnel at its on-site command post, the company regional emergency operations centre (REOC), and the corporate EOC.

The licensee is expected to clearly outline the communication protocols and procedures to be used between these command centres to provide effective information flow among licensee representatives and other responders at the emergency site, corporate-level decision-makers, the ERCB, and other government departments and agencies.

The ERCB strongly supports the use of the incident command system (ICS) as a means of ensuring consistent command and communication among all parties.

2.1.5 Reception Centre

10) In its corporate-level ERP, the licensee must set out the procedures for

- activating a reception centre located at a safe distance from the release source, and
- meeting and registering evacuees at the reception centre.

3 Emergency Planning and Response Zones

3.1 Emergency Planning Zone

An emergency planning zone (EPZ) is a geographical area surrounding a well, pipeline, or facility containing hazardous product that requires specific emergency response planning by the licensee.

1) The licensee must ensure that the actual size and shape of the final EPZ reflect

- site-specific features of the area,
- information gathered during the public involvement program (see Section 4), and
- factors such as population density, topography, and access/egress routes, which may affect timely implementation of emergency response procedures in the EPZ.

Emergency planning and response zones, including the EPZ, are illustrated in Figure 1. Note that response begins at the source of the release and is undertaken in a coordinated manner by industry, the local authority, and other responders as needed at the time of the incident.

Figure 1. Emergency planning and response zones

3.2 Calculating EPZs for Hydrogen Sulphide

ERCBH2S is a software program that calculates site-specific EPZs using thermodynamics, fluid mechanics, atmospheric dispersion, and toxicology modelling.

2) The licensee must use ERCBH2S properly, prior to filing the ERP, to calculate the size of the EPZ for sour gas with a hydrogen sulphide (H_2S) concentration of 0.1 moles per kilomole (mol/kmol) (0.0001 mole fraction or 100 ppm) or greater.

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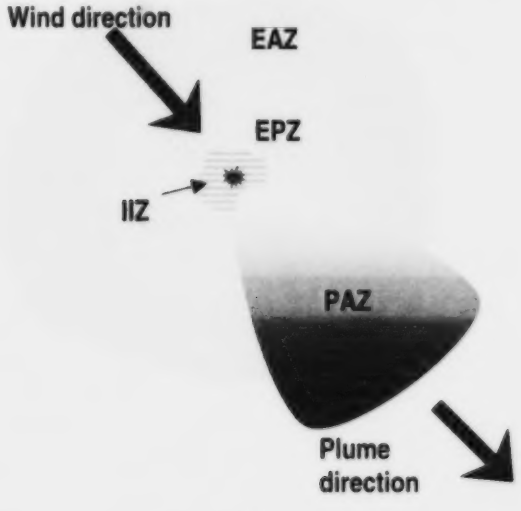

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3) The licensee must electronically submit a copy of the CSV batch export file from ERCBH2S in support of the ERP application to the EPA Section at EPAssessment@ercb.ca.

The ERCBH2S model includes both user input variables and model parameters. Model parameters are variables that have been carefully selected by the ERCB and cannot be changed by the user. The user input variables reflect the site-specific conditions, operating practices, and specific technology employed.

The licensee should be prepared to defend and provide documentation for all user selected inputs in the determination of the EPZ. For producing wells, mitigation measures, such as ignition, surface-controlled subsurface safety valves (SCSSV), and downhole chokes have the potential to limit release durations or reduce release rates and can be used in the determination of the EPZ.

Timing for ignition of the release or shut-in of the pipeline may depend on several factors, including travel time, automated leak detection devices, manual shut-in, or other notification of leakage. Optimization of systems or defining appropriate procedural actions demonstrates good hazard management practices and is encouraged.

ERCBH2S also predicts emergency response zones for sulphur dioxide (SO_2). This information is useful in preparing the ERP and provides valuable information to the licensee and local authorities in coordinating each party's roles and responsibilities.

4) If ERCBH2S indicates that SO_2 could be a concern after ignition, the licensee must identify it in the ERP and address preplanned procedures to monitor and respond to the hazard.

3.2.1 Sour Gas Wells

The H_2S release rate entered into ERCBH2S is determined by the wellhead absolute open flow (AOF) according to the type of well operation (see Table 1). The ERCB requires that the H_2S release rate assessment be conducted in accordance with *Directive 056*. Because the H_2S release rate is an important factor in determining the EPZ, the ERCB strongly encourages the filing of a presubmission H_2S release rate assessment to its Geology and Reserves Group for review prior to the submission of an application.

Table 1. AOF determination for EPZ calculation

Type of well operation	Wellhead AOF determination
Drilling	Up casing/open hole
Completion	Up casing or up tubing if completing in the production mode[2]
Producing/injection	Up tubing
Servicing/workover	Up casing (if tubing removed)

[2] Production mode means that at the end of drilling and casing operations, tubing and packer are run in with the service rig and a production wellhead installed. The completion stimulation is done with the wellhead on (i.e., using coiled tubing run through the tubing and packer).

3.2.2 Sour Oil Wells, Sour Water Disposal Wells, and Sour Observation Wells

Sour oil wells producing oil effluent with a gas-to-liquid ratio less than or equal to 1000 m^3/m^3, sour water disposal wells, and sour observation wells operate with essentially no separate gas phase at operating pressure. However, a depressured spill pooling on the ground may release sour solution gas dissolved in the liquid.

The EPZ is determined by the H_2S release rate and is calculated using the maximum expected H_2S concentration in the gas phase (at stock tank conditions), the maximum gas-to-liquid ratio for the fluids (at stock tank conditions), and the maximum liquid flow rate. The solution gas composition of the stock tank gas (15°C and 101.325 kilopascals [kPa], dry gas) is entered into ERCBH2S. For wells that cannot flow to the surface without mechanical assistance, the H_2S release rate is considered zero. These wells therefore do not require an ERP.

3.2.3 Sour Gas Pipelines

Sour gas pipelines contain H_2S in the gas phase and include sour gas with greater than 10 mol/kmol, natural gas with less than or equal to 10 mol/kmol, and acid gas or oil effluent with a gas-to-liquid ratio greater than 1000 m^3/m^3. Oil effluent is produced from oil wells and is a multiphase mixture with hydrocarbon liquids, gas, and produced water in any combination. If liquids are present, they do not form a pool but are released as an aerosol as the pipeline depressurizes.

The gas phase composition at reference conditions (15°C and 101.325 kPa, dry gas) is entered into ERCBH2S. The combined composition of the gas and liquid phases could be entered but is not required. The H_2S volume released from each pipeline segment is used to calculate the size of the EPZ. The segment volume depends on many pipeline factors, including, in decreasing order of importance, pressure, diameter, emergency shutdown (ESD) valves, closure, length, and temperature. Pipeline ESD valves close according to a pressure drop set point, by detecting a pressure rate of change, or by remote/manual closure. The volume of gas released upon a release from a pipeline segment depends on the ESD valve closure and affects the size of the EPZ.

3.2.4 Sour Liquid Pipelines

Pipelines transporting sour oil effluent with a gas-to-liquid ratio less than or equal to 1000 m^3/m^3, crude oil, low pressure products, or salt water operate with essentially no separate gas phase at operating pressure. However, a depressured spill pooling on the ground may release sour solution gas dissolved in the liquid. The solution gas composition of the stock tank gas (15°C and 101.325 kPa, dry gas) is entered into ERCBH2S. The EPZ is determined by the H_2S release rate and is calculated using the maximum expected H_2S concentration in the gas phase (at stock tank conditions), the maximum gas-to-liquid ratio for the pipeline fluids (at stock tank conditions), and the maximum pipeline liquid flow rate.

3.2.5 Facilities

The EPZ for a facility that handles or processes sour fluids is the largest EPZ of any pipeline entering or leaving the facility measured outward in all directions from the facility lease boundary. If the facility has a sour gas well, sour water disposal well, or acid gas disposal well on site, the EPZ for the well may determine the size of the EPZ for the facility.

3.3 Calculating EPZs for HVP Product

The primary hazard associated with high vapour pressure (HVP) products is direct exposure to flame. The largest hazard area for emergency response planning is based on a flash fire. There is no specific model currently provided by the ERCB for calculation of the EPZ for HVP product release.

New requirements are in place for HVP operations. Operators are strongly encouraged to use the table in Appendix 10 of the draft *CAPP Companion Planning Guide to ERCB Directive 071*[3] or an appropriate dispersion model to determine the EPZ size for a pipeline release of HVP product. The EPZ for an HVP facility is calculated using the EPZ for the largest pipeline entering or leaving the facility measured from the facility inlet. The EPZ for an HVP product release from a cavern storage facility should be determined using a dispersion model. The licensee should ensure that persons undertaking a hazard assessment for HVP product are competent and suitably qualified by virtue of their training and experience.

When a dispersion model is used to calculate EPZ size, detailed documentation may be required for review by the ERCB, if requested, that clearly describes the methods, assumptions, and modelling uncertainties in enough detail that a third party could duplicate the numerical results.

3.4 Emergency Awareness Zone

The emergency awareness zone (EAZ) is an area outside of the EPZ where public protection measures may be required. Although the EPZ is the key planning area for the licensee's ERP, there is potential for impacts within and beyond the EAZ during a hazardous release.

3.4.1 EAZ for an H_2S Release

The boundary of the EAZ is calculated using ERCBH2S and is based on the maximum distance to the indoor H_2S concentration of 10 ppm at any particular moment.

3.4.2 EAZ for an HVP Product Release

The EAZ for an HVP product release is an area outside of the EPZ. The EAZ outer boundary is 1.5 times the calculated EPZ radius measured from the well, pipeline, or facility.

3.5 Initial Isolation Zone

The initial isolation zone (IIZ) defines an area in close proximity to a continuous hazardous release where indoor sheltering may provide temporary protection due to the proximity of the release. For H_2S releases under poor dispersion conditions, the IIZ is defined and calculated using the ERCBH2S model and is very useful for planning purposes. The IIZ does not have to be drawn on the ERP map; however, IIZ information from the ERCBH2S model should be readily available to aid responders in protecting the public.

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[3] Available on the Canadian Association of Petroleum Producers (CAPP) Web site www.capp.ca.

4 Public and Local Authority Involvement in Emergency Preparedness and Response

4.1 When Are Notification and Consultation Required?

1) The licensee must carry out public and local authority[4] notification and consultation for situations outlined in Table 2.

Table 2. When to notify and consult

Situation	Notification and consultation requirements	
Developing a site-specific ERP - sour well - sour operations - HVP pipeline - cavern storage facility	**Notification** of and **consultation** with members of the public within the EPZ are required prior to submitting an application to the ERCB for approval when - developing a sour well site-specific drilling and/or completion ERP - developing a sour operations ERP - developing an ERP for HVP pipeline and cavern storage facilities **Consultation** is required with the local authority and others listed in Section 4.2 to confirm and coordinate each party's roles and responsibilities. **Notification** and **consultation** are required if an existing EPZ either increases or decreases from its current size based on the following:	
	Change	**Action**
Change in EPZ size	New EPZ is smaller than current EPZ	Residents who are no longer within the EPZ and the local authority are to be notified and informed of the change.
	New EPZ is larger than current EPZ	Residents within the expanded portion of the EPZ and the local authority are to be notified and informed of the change in accordance with the requirements in Section 4.3.

4.2 Preparing for the Public Involvement Program

2) The licensee must identify all residents and local authorities within and adjacent[5] to the EPZ.

3) If an EPZ intersects an urban density development, the licensee must include the entire development within the EPZ for the purpose of conducting the public involvement program.

4) If an EPZ includes a portion of an urban centre, the licensee is not required to identify each individual residence within the urban centre; however, contact must be made with the appropriate urban director(s) of emergency management to review key emergency response information and confirm and coordinate each party's roles and responsibilities.

5) The licensee must identify in its ERP all urban density developments, campgrounds, and public facilities, such as schools, community centres, and senior citizen centres, within the EAZ; however, direct notification and consultation are not required.

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[4] First Nations reserves and Métis settlements within the EPZ are considered to be local authorities and are required to be notified and consulted as a local authority.

[5] See Appendix 1: Definitions for the Purposes of *Directive 071*.

6) Prior to commencement of the public involvement program, the licensee must confirm and coordinate roles and responsibilities in accordance with the protocols established with

- the local authorities,
- the directors of emergency management (or designates/deputy directors) for all municipalities within and adjacent to the EPZ, and
- the local RHA or applicable federal health branch.

Under Section 11 of the *Emergency Management Act*, the local authority of each municipality is responsible for the direction and control of the local authority's emergency response. The local authority's Municipal Emergency Plan (MEP) describes its framework for response to major emergencies and disasters. The licensee should be familiar with the structure of an MEP, which can be accessed through the Alberta Emergency Management Agency.

7) The licensee must attempt to reach a mutual understanding with local authorities on the specific needs and roles and responsibilities of each party during an emergency and include a summary of the roles and responsibilities in its ERP reflecting the mutual understandings.

This is to ensure that there is no confusion or misunderstanding of the roles and responsibilities in the event of an incident requiring activation of the ERP. If the licensee and the local authority fail to reach a mutual understanding on roles and responsibilities, the ERCB encourages the use of third-party dispute resolution services through either local synergy groups or independent practitioners to assist in resolving the parties' concerns. If appropriate, and with agreement from both parties, the ERCB may provide facilitation through its Appropriate Dispute Resolution Program.

If changes to the ERP are necessary as a result of public consultation, the licensee is required to have further discussions with the appropriate local authority and other government agencies.

The ERCB also strongly encourages the licensee to support and work with local synergy groups that have been established in areas throughout the province, whenever possible.

4.3 Conducting the Public Involvement Program

8) The licensee must notify or notify and consult those listed in Table 3.

Table 3. Who to notify or notify and consult within the EPZ

Notification and Consultation	Notification Only
Permanent and part-time residents, including those residing on dead-end roads beyond the EPZ where occupants are required to egress through the EPZ.	Nonresident landowners and farmers renting land who don't live on the property but whose lands are within the setback distance as outlined in *Directive 056*. These persons must be considered in the development of the ERP and be advised that their property lies within the EPZ through an information package sent by registered mail.
Business owners and/or operators and industrial operators, including oil and gas operators with manned facilities.	Registered trappers, guides, outfitters, and registered grazing lease and allotment users.
Private and public recreational property owners, operators, and occupants.	Oil and gas operators with unmanned facilities (e.g., wells).
Rural public facilities and publicly used development, such as schools, community centres, registered campgrounds, and picnic areas.	Owners of rented residences in an EPZ must be advised that their property lies within the EPZ through an information package sent by registered mail.

9) The licensee must

- conduct the consultation through face-to-face visits with all requisite individuals;
- offer to conduct the consultation by telephone if residents do not wish to meet the licensee representative face-to-face;
- offer to send residents a public information package by registered mail if they do not wish to participate in the consultation process; regular mail is acceptable if the resident agrees;
- review key emergency response information with members of the public identified in the EPZ who wish to participate in the consultation process, to familiarize them with potential emergencies and corresponding public protection measures pertaining to emergency response procedures; the licensee representative is expected to have the necessary knowledge to provide details of the emergency response procedures in place and to address questions and concerns that may arise; and
- address any request for additional information or for modifications to the ERP by the individual consulted.

10) The licensee must notify residents of urban centres that they are within the EPZ and provide details of the public protection measures available in the event of an emergency. This may be done through a combination of appropriate notification methods, such as mailouts, open houses, and newspaper advertisements.

The ERCB recognizes that the licensee may sometimes have difficulty establishing contact or meeting in person with

- residents who may be away for extended periods of time, have "no trespassing" signs posted on their property, or have unlisted telephone numbers; and
- nonresidents, such as registered trappers, industrial operators, and recreational property owners, operators, and occupants.

11) The licensee must attempt to contact these persons to arrange a suitable meeting place and time to address any questions and concerns regarding the ERP or response procedures or provide a public information package by registered mail with an offer to meet. It is the licensee's responsibility to show that reasonable efforts were made.

4.3.1 Public Information Package

Although the public information package may vary in content, it should contain sufficient information to ensure that the persons contacted understand the nature of the operation, the impact an emergency may have on them, the procedures in place to respond to an emergency, and the public protection measures. The public information package does not have to be submitted with the ERP; however, the ERCB may request that it be submitted if

- the ERP is part of an ERCB hearing,
- a post-approval audit is being conducted on the ERP, or
- the ERP has been selected under the ER Assessment Program.

12) The licensee must

- develop a public information package for distribution during the public involvement program, and
- provide all persons identified in Table 3 with a copy of the public information package.

The licensee should provide a reasonable amount of time, having regard for the specific circumstances of each individual, for recipients to review the public information package and have questions and concerns addressed.

13) The licensee must, as a minimum, include the following in the public information package:

- a brief overview of the operations;
- identification of the potential hazards associated with the wells, pipelines, or facilities;
- range of release rates, release volumes, H_2S concentrations (if applicable) and EPZ determinations for all wells, pipelines, and facilities;
- a map of the operations in the general area;
- a 24-hour emergency licensee contact telephone number[6] (the ERCB requires that a call to this telephone number initiates immediate action), a local ERCB Field Centre 24-hour emergency telephone number, and local authority office telephone numbers;
- a description of potential health impacts that could result from exposure to H_2S, HVP product, or SO_2,[7] if applicable;
- information on special emergency procedures unique to the community, such as those used by hospitals and schools, that could affect emergency response;
- information on public protection measures for evacuation, sheltering, and ignition; and
- procedures in place to respond to an emergency.

For EPZs that cover a large geographic extent, a licensee may elect to create multiple information packages designed to address specific planning areas and include the applicable ranges of release rates, volumes, and EPZ determinations for each area.

The licensee should provide nonconfidential information requested by a resident for any well, pipeline, or facility that is included in the public information package.

14) Prior to commencement of the public involvement program, the licensee must provide a copy of the public information package to the local ERCB Field Centre so that ERCB staff can respond to questions and concerns from area residents.

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[6] This number must also be posted at all licensee wells, pipelines, and facilities.

[7] Refer to documents such as Alberta Health and Wellness *Health Effects Associated with Short Term Exposure to Low Levels of SO_2* (April 2006) and *Health Effects Associated with Short Term Exposure to Low Levels of H_2S* (July 2002).

4.4 Information Required From the Public Involvement Program

15) A licensee must attempt to obtain the following information for incorporation into its ERP:

- exact location of the residence, place of business, or public facility, including egress route issues (legal description or address);
- name of key contact and a 24-hour contact telephone number (home, business, cell phone, or other) and an alternate contact, if possible;
- names of all family members in residence;
- number of occupants, specifying adults and preschool and school-age children;
- names of those with special needs or specific requirements; the licensee representative is expected to inform members of the public that they can be considered to have special needs and require early notification or evacuation without having to divulge their personal health issues;
- any additional concerns or comments; and
- any other information deemed necessary to allow for effective emergency response procedures to be developed.

Members of the public have the right to **refuse** to provide their personal information. The licensee should discuss the protection of rights under the *Personal Information Protection Act (PIPA)* with members of the public and clearly explain that the information is important to provide an effective emergency response and ensure their protection and safety.

Personal information in the hands of the licensee is governed by *PIPA* and when it is filed with the ERCB by the *Freedom of Information and Protection of Privacy Act*. The licensee should acquire only information necessary to implement the ERP and should provide this information to key emergency responders and the ERCB.

16) If members of the public are unwilling to provide personal information, the licensee must consider those residents as having special needs.

Although public safety is the primary purpose of emergency preparedness and response, the licensee is expected to address livestock and pet safety in its public involvement program and ERP, if feasible.

Other guidelines, such as CAPP's *Guidelines for Effective Public Involvement,* may also assist in preparing for and conducting public involvement programs.

5 Common Requirements for ERPs

Section 5 contains the common requirements for developing the different types of ERPs described in Sections 6, 7, 8, and 9.

5.1 Assessment Matrix for Classifying Incidents

All incidents are classified as an alert or as a level-1, -2, or -3 emergency. Incidents that can be handled on site through normal operating procedures are very low risk and are typically defined as an **alert**. Those with low to high risk require a more difficult or complex resolution and are defined as **emergencies**.

1) The licensee must include all the information in Appendix 4 in its ERP.

2) The licensee must define appropriate actions, including public protection measures, that would be taken for each level of emergency.

5.2 Public Protection Measures

ERPs address key roles and responsibilities of responders to protect the public during emergency situations. Section 5.2 identifies the public protection measures that the licensee is required to address in its ERP.

5.2.1 Notification Within the EPZ

3) The licensee's ERP must include specific procedures for how and when notification will take place within the EPZ.

5.2.2 Evacuation and/or Sheltering Within the EPZ

4) The licensee must address how the evacuation of the response zones that are within the EPZ will be accomplished during an incident, including how transients, such as hunters, trappers, recreational users, and nonresident landowners, will be located and evacuated.

5) Special procedures may be required for evacuating public facilities. If large numbers of people are involved, the licensee must address assistance with transportation (e.g., providing school buses) or changes in the normal notification procedures.

Sheltering indoors is a viable public protection measure in circumstances when

- there is insufficient time or warning to safely evacuate the public that may be at risk,
- residents are waiting for evacuation assistance,
- the release will be of limited size and/or duration,
- the location of a release has not been identified, or
- the public would be at higher risk if evacuated.

6) The licensee must include shelter-in-place instructions[8] in its public information package and ERP.

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[8] The CAPP best practice shelter-in-place document is an example of the type of information that could be included in the information package and ERP. Other shelter-in-place documents should be equivalent to this document.

Public information packages should contain additional information for the management of potential ignition sources during an HVP release.

5.2.3 Notification and Evacuation Outside the EPZ

7) As part of its consultation with the local authority, the licensee must discuss how notification and evacuation will take place outside the EPZ and include a summary of that discussion in its ERP.

The RHA also has a role in evacuation in accordance with the *Alberta Public Health Act*, Section 52.2.

5.2.4 Ignition Criteria

5.2.4.1 Sour Well Releases

8) The licensee must

- include ignition procedures (e.g., ignition criteria flowchart) in its ERP, including a description of the equipment to be used in the event ignition criteria are met, and
- acknowledge in its ERP that ignition authority will be assigned to a licensee representative on site.

5.2.4.2 HVP Product Releases from a Pipeline or Cavern Storage Facility

9) The licensee must include in the ERP an ignition policy that addresses the following:

- the approach to identifying the location of a plume;
- items to consider when making the decision to ignite a release, such as changing weather conditions;
- ignition procedures and a description of the equipment to be used in the event ignition criteria are met;
- protocols supporting a decision to ignite a release, which include emergency response procedures for immediate ignition and actions to be taken if the release occurs while personnel are on site;
- actions required prior to attempting ignition of a dispersing HVP plume, such as establishing the perimeter of the dispersing vapour cloud, and
- person(s) authorized to carry out ignition and a description of actions to be taken following ignition.

5.2.5 Isolation Procedures

During an incident, members of the public may be at risk if exposed to the hazard.

10) The licensee must ensure that procedures, such as establishing and managing manned roadblocks, are identified in the ERP and are in place to restrict unauthorized entry into the response zones during a sour gas or HVP product release that could potentially jeopardize public safety.

The licensee should identify any special procedures needed to address any major highways and railways passing through the EPZ that could be impacted by the hazard.

5.2.6 Air Quality Monitoring

Air quality monitoring is used for tracking and recording the presence and concentrations of H_2S during a sour gas release and SO_2 following the ignition of the release or the presence and lower explosive limit (LEL) levels of HVP product following a release.

Air quality monitoring equipment is used to

- track the plume,
- determine if ignition concentration criteria are met,
- determine whether evacuation and/or sheltering concentration criteria have been met,
- assist in determining when the emergency status can be downgraded,
- determine roadblock locations, and
- determine concentrations in areas being evacuated to ensure that evacuation is safe.

The type of air monitoring units and the number of monitors required are based on site-specific information, including

- access and egress points,
- population density and proximity to urban density developments, and
- local conditions.

11) The licensee must provide details in its ERP on the intended use and procedures surrounding the activation of air quality monitoring equipment, such as stationary and mobile air quality monitoring units and personal handheld monitors.

5.3 Maps

12) The licensee must ensure that maps included in the ERP are sized to provide a clear representation of the entire mapped area and clearly identify
    - surface location(s) of the operation(s) and access roads;
    - EPZ and EAZ boundaries;
    - locations within the EPZ of residences and their reference numbers, including those residences adjacent to the EPZ or on dead-end roads requiring egress through the EPZ;
    - provincial, local, and access roadways and dead ends in the EPZ and the EAZ;
    - lakes, rivers, streams, and any elevation feature that could impact emergency response in the EPZ and the EAZ;
    - urban density developments, campgrounds, recreation areas, public facilities (e.g., churches, schools, hospitals), and any other publicly used development within the EPZ and EAZ;
    - trapping area, grazing lease, and range allotment boundaries and their reference numbers;
    - other industrial operations, including oil and gas operations;
    - railways and airports;
    - corporate boundaries (e.g., hamlets, villages, towns);

- municipal and RHA boundaries;
- a legend, scale, and north directional indicator; and
- for sour well site-specific drilling and/or completion ERPs only, potential roadblock locations.

5.4 Equipment List

A wide range of equipment is required to effectively respond to an emergency.

13) The licensee must ensure that the ERP includes a list (including location, number, and type) of the following:

- communications equipment for the public safety coordinator, rovers, roadblock and air monitoring personnel, and any others that require it (the licensee is responsible for ensuring that communications equipment is made available to key response personnel);
- equipment for roadblock kits (including contents);
- ignition equipment that is maintained on site; and
- gas monitoring equipment.

5.5 Mutual Aid Understandings

Mutual aid understandings should define each participant's commitment to provide aid and support during an incident and may also include other responsibilities agreed to during planning. The licensee is encouraged to provide details of mutual aid understandings in the ERP.

5.6 Telephone Lists

14) The licensee must include in its ERP

- a telephone list of key internal personnel designated to assist in emergency response; and
- a telephone list of external emergency support services that may be required in an emergency, including, but not limited to, government departments and agencies, communication services, air monitoring services, emergency services, and oil spill cooperatives.

5.7 Plan Distribution

The licensee is required to submit one paper copy of the ERP to the ERCB for review and approval. Once the ERP is approved, it becomes a public document and may be subject to disclosure, excluding confidential resident and personal information. It may distribute the ERP to others electronically, as long as a hard copy is provided upon request.

15) As soon as a sour operations, HVP pipeline, cavern storage facility, or sour well site-specific drilling and/or completion ERP has been approved by the ERCB, the licensee must distribute copies to the government departments and agencies listed in Appendix 5 within 10 business days after approval, unless the government agency requests otherwise in writing.

The licensee should provide additional copies (either full or partial) of the ERP to all responders requiring one. The need for distribution is determined through communication with all responders during plan development. The licensee should maintain a record of ERP distribution, including amendments.

16) The licensee must provide a copy of the ERP, excluding confidential resident and personal information, to any resident within the EPZ who requests in writing to have a copy.

17) The licensee must ensure that all required plan holders have a copy of the approved ERP.

18) The licensee must ensure that a plan distribution list is included in the ERP.

5.8 Communications Planning

The development and implementation of an effective communications plan is essential to emergency response.

19) The licensee must

- describe its procedures in the ERP for contacting and maintaining communication with key licensee personnel, government agencies, support services, and the media;
- clearly define the responsibility to contact the ERCB and other responders identified in the plan in the event of an emergency; the ERCB recommends that a communications flowchart be included in the ERP, identifying responsibilities by role;
- ensure that the ERP clearly describes procedures that will be implemented during an incident to contact and maintain communication with directly impacted members of the public in order to keep them informed of the situation and actions being taken; this includes plans for communicating implementation of public protection measures, such as evacuation and sheltering in place for occupants within and beyond the EPZ, if applicable; and
- describe procedures that will be used to inform and update the media and procedures in getting factual messages out to the public at large in an expeditious manner; the messages should be coordinated among all parties.

20) If there are separate ERPs for a gathering system that is tied into the sour operations facility, HVP pipeline, or cavern storage facility, then all the licensees must ensure that their ERPs have a bridging paragraph outlining what emergency communication will take place between the parties in the event of an emergency. The sour operations, HVP pipeline, or cavern storage facility ERP bridging paragraph refers to the other ERPs and vice versa.

5.9 Responsibilities of Personnel

21) In its ERP, the licensee must

- identify roles and responsibilities of personnel required to effectively respond to the emergency, and
- provide the names of key personnel and responders.

One or more functions can be assigned to an individual depending on the complexity of the potential response to an emergency. As a minimum, the licensee is expected to assign the following responsibilities to personnel, if applicable:

- field incident command,
- public safety coordination, including evacuation and sheltering,
- roadblocks and rovers,
- air quality monitoring,
- ignition, and
- communication with the responders, media, and public.

5.10 Incident Management Systems

22) In its ERP, the licensee must

- describe how it will manage and coordinate a response to an emergency, and
- address the roles and responsibilities of personnel at its on-site command post, company REOC, and corporate EOC.

The licensee is expected to clearly outline the communication protocols and procedures to be used between these command centres to provide effective information flow among licensee representatives and other responders at the emergency site, corporate-level decision-makers, the ERCB, and other government departments and agencies.

The ERCB strongly supports the use of the incident command system (ICS) as a means of ensuring consistent command and communication among all parties.

5.11 Record Keeping

23) As part of its notification and consultation programs, the licensee must have a process for recording the following:

- local authority and other government discussions,
- type of notification provided to the residents in an urban centre,
- attempts made to contact an individual if the licensee was unable to make contact, and
- consultation with the public, including unsuccessful attempts to contact or obtain the cooperation of any required persons and any outstanding issues yet to be resolved.

5.12 Reception Centre

24) The licensee must include procedures in the ERP for establishing, activating, staffing, and meeting and registering evacuees at the reception centre.

5.13 Downgrading and Stand-Down of Emergency Levels

25) The licensee must include procedures in the ERP to downgrade and stand-down levels of emergency.

6 Sour Well Site-specific Drilling and/or Completion ERPs

6.1 ERP Submission Requirements

1) The licensee must submit a sour well site-specific drilling and/or completion ERP to the ERCB for approval in accordance with Table 4 or for any other situation in which the ERCB determines that a plan is required.

Table 4. Need for a sour well site-specific drilling and/or completion ERP

Well type	Operation	Surface development within the EPZ	No surface development within the EPZ
Critical sour	Drilling and/or completion	Yes	Yes
Noncritical sour		Yes	No

As noted in Table 4, surface development within the EPZ influences whether an ERP is required. Surface development includes residences that are required to egress through the EPZ and residences immediately adjacent to the EPZ.

In the event that a licence application requires a public hearing, the licensee is expected to develop and provide an ERP to the ERCB that has been deemed technically complete prior to issuing a notice of public hearing.

A sour well site-specific drilling and/or completion ERP may be used for testing, workover, or well servicing operations on that well for a period of up to one year after ERCB approval provided that those operations are detailed in the ERP at the time of approval and the resident information is kept current.

6.2 ERP Content Requirements

This section sets out the required content for sour well site-specific drilling and/or completion ERPs.

2) The licensee must ensure that site-specific ERPs address the requirements in Sections 4 and 5 of this directive and include the following:

- introduction and summary,
- key licensee contacts, including 24-hour contact phone numbers (the ERCB requires that a call to any of these numbers initiates immediate action),
- appropriate ERCB Field Centre 24-hour emergency phone number,
- name and legal description of well (surface and bottomhole location),
- licence number, if available,
- maximum cumulative H_2S release rate and concentrations,
- an electronically submitted copy of the CSV batch export file from ERCBH2S,
- general land use, including population density in the area, number of residents, level of transient use, public facilities, and roads;
- distance to the nearest urban centre and residence, and
- schedule (expected spud date, date of entry into the sour zone, and estimated time in the sour zone).

6.3 Critical Sour Well Approval

All critical sour well site-specific drilling and/or completion ERPs are approved by the ERCB in conjunction with the well licence.

3) The licensee must ensure that the approved critical sour well site-specific drilling and/or completion ERP is

   - on site prior to drilling out surface casing and for the duration of the drilling operation, and
   - on site prior to commencement of any completion operation and for the duration of the completion operation.

6.4 Noncritical Sour Well Approval

Noncritical sour well site-specific drilling and/or completion ERPs can be submitted to the ERCB before, during, or after the well licence application.

4) The licensee must ensure that noncritical site-specific sour well drilling and/or completion ERPs are

   - approved prior to spud,
   - on site prior to drilling out surface casing and for the duration of the drilling operation, and
   - approved and on site prior to commencement of any completion operation and for the duration of the completion operation.

If a sour well site-specific ERP has been approved for drilling and/or completion operations and the operations covered by the ERP have not commenced within a year of issuance of the ERP approval, the approval expires. A new ERP has to be submitted for review and approval if the licensee wishes to carry out the drilling and/or completion operations. A sour well site-specific drilling and/or completion ERP is in effect immediately after drilling out surface casing and for the duration of the completion operation.

6.5 Additional Conditions to ERP Approval

As stated in Section 6.1, a sour well site-specific drilling and/or completion ERP can be used for testing, workover, or well servicing operations for a period of one year after ERCB approval. Prior to commencing any of these operations, on-site activities, such as rigging up and/or spotting of equipment, may proceed without having the ERP on site.

5) The licensee must not remove any component from the wellhead until the approved sour well site-specific drilling and/or completion ERP is on site.

6.6 ERPs for Temporary Surface Pipelines

For in-line testing of a sour gas well, a temporary surface pipeline connected to a gathering system will minimize or eliminate flaring. A licensee may include the temporary surface pipeline in its sour well site-specific drilling and/or completion ERP provided that the EPZ for the pipeline falls within the well EPZ and that public notification and consultation for residents within the pipeline EPZ have taken place. A separate approval will be required if the temporary surface pipeline extends beyond the EPZ boundary for the well.

6.7 ERPs for Multiwell Programs

ERPs may be developed and submitted for multiwell programs if site-specific information for each individual well is included. Common procedures and infrastructure may be developed for the entire program as long as they remain current for the duration of the project.

6.8 Sour Underbalanced Drilling Operations

The licensee may conduct underbalanced operations prior to entering a sour zone with surface development within the EPZ. Before conducting underbalanced drilling operations, the licensee is expected to

- file the sour well ERP as a nonroutine application, and
- submit a letter to the EPA Section confirming that no sour formation will be encountered while drilling underbalanced and providing details on the start and end dates for the underbalanced drilling operation.

The ERCB will not approve sour underbalanced drilling operations if members of the public are located inside the EPZ. The ERCB will, however, consider licensing sour underbalanced drilling operations if members of the public would be temporarily relocated from the EPZ during drilling operations.

7 Sour Operations ERPs

7.1 ERP Submission Requirements

A sour operations ERP may be required for the following:

- wells producing from a sour zone,
- wells producing from a sour zone that are currently shut-in but are not suspended in accordance with *Directive 013: Suspension Requirements for Wells*,
- wells on injection with sour gas in the injection fluid,
- wells that are completed or open to a sour zone but are not tied in,
- facilities that handle or process fluids containing sour gas,
- any combination of the above, or
- a plan covering all operations in an area, commonly referred to as a sour production facility ERP.

As noted in Table 5, surface development within the EPZ influences whether an ERP is required.

1) The licensee must have an approved sour operations ERP for situations listed in Table 5 or for any other situation in which the ERCB determines that a plan is required.

Table 5. Need for a sour operations ERP

	Surface development within the EPZ	No surface development within the EPZ
Sour pipeline operation	Yes	No
Producing, shut-in, or injecting noncritical sour well	Yes	No
Producing, shut-in, or injecting critical sour well	Yes	Yes
Sour facility operation	Yes	No

A sour operations ERP is **not required** for the following:

- a well that has been properly abandoned in accordance with *Directive 020: Well Abandonment Guide*,
- a well that has been suspended in accordance with *Directive 013: Suspension Requirements for Wells*,
- a standing well where the casing has not been perforated and the sour zone is isolated behind casing with adequate cement, or
- on a case-by-case basis, a well with a sour drilling and/or completion ERP that has recent resident updates and is less than a year old.

The different types of sour operations ERPs and the supplements that can be submitted to cover off various operations are illustrated in Figure 2.

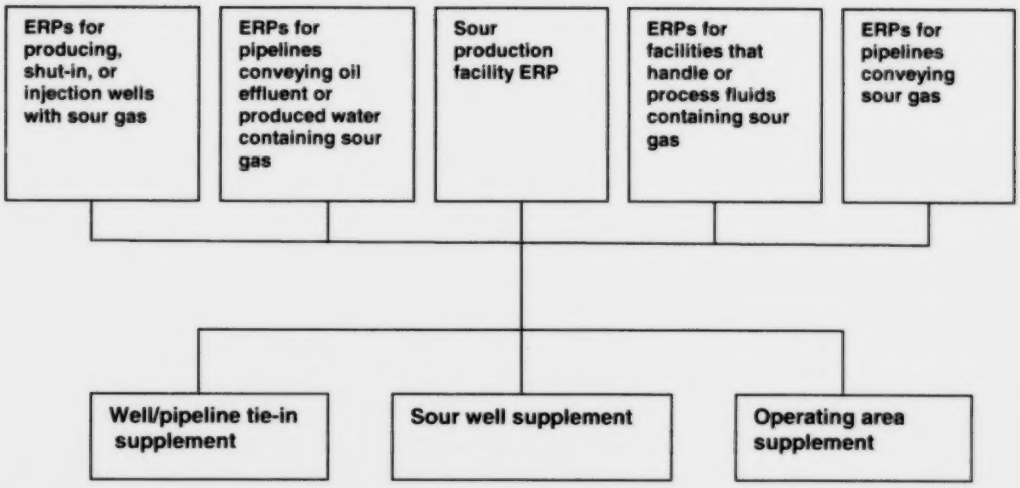

Figure 2. Types of sour operations ERPs and supplements

2) The licensee must ensure that the ERP is approved by the ERCB before commencement of operations.

The licensee is expected to provide the location of the approved ERP in its plan.

In the event that a licence application requires a public hearing, the licensee is expected to develop and provide an ERP to the ERCB that has been deemed technically complete prior to issuing a notice of public hearing.

7.2 ERP Content Requirements

This section sets out the required content for sour operations ERPs.

3) The licensee must ensure that ERPs for these operations address the requirements in Sections 4 and 5 of this directive and include the following information, if relevant to the ERP:

- introduction and summary;
- key licensee contacts, including 24-hour contact phone numbers (the ERCB requires that a call to any of these numbers initiates immediate action);
- appropriate ERCB Field Centre 24-hour emergency phone number;
- brief overview of the sour operations covered under the ERP;
- general land use, including population density in the area, number of residents, level of transient use, public facilities, and roads;
- date of latest revision;
- wells, pipelines, and sour facilities information, which includes
  - surface location of wells, ESD valves, and pipelines and name and legal description of facilities,

- size and configuration of the EPZs for all wells, pipelines, and sour production facilities,
- an electronic copy of the CSV batch export file from ERCBH2S,
- operational status,
- licence numbers of all facilities, pipelines, and wells, and
- general proximity to the nearest urban centre and/or residence; and

- procedures for incident detection, notification, and confirmation, which includes
  - a description of how an emergency will be detected,
  - a description of how the licensee will be alerted of an incident, and
  - a description of how confirmation of a release will occur.

7.3 Supplements and Updates/Amendments

A supplement to an approved sour operations ERP may be required for the following:

- addition of new well/pipeline tie-ins or facilities,
- addition of operating areas,
- significant changes to the EPZ or new residences within the EPZ,
- drilling and/or completion operations (see Section 7.3.1), and
- sour well workovers, well servicing, and testing (see Section 7.3.2).

4) The licensee must submit a supplement to the ERCB for review and approval when adding well/pipeline tie-ins, facilities, and operating areas to an approved sour operations ERP if

   - all or a portion of the EPZ for the added operations falls outside the existing sour operations ERP EPZ, and
   - there is surface development inside the portion of the EPZ that falls outside the existing sour operations ERP EPZ.

   Supplements are to be submitted prior to commencement of operations unless a currently operating system is added to an existing sour operations ERP.

5) The licensee must conduct a public involvement program for all new members of the public in the portion of the EPZ that falls outside the existing sour operating ERP EPZ.

   An update/amendment to an approved sour operations ERP is required after adding well/pipeline tie-ins, facilities, and operating areas to an approved sour operations ERP if

   - there is no change to the size of the existing sour operating ERP EPZ, or
   - all or a portion of the EPZ for the added operations falls outside the existing sour operations ERP EPZ, and
   - there is no surface development inside the portion of the EPZ that falls outside the existing sour operations ERP EPZ.

An update/amendment does not have to be approved by the ERCB.

6) As a minimum, the licensee must submit the following additional information in the supplement to the ERCB:

- complete resident information for the EPZ,
- well, pipeline and/or facility location,
- the size of the EPZ, including supporting information,
- an EPZ map (in accordance with Section 5.3),
- a telephone and distribution list specific to the operation (in accordance with Section 5.6), and
- any additional emergency response procedures specific to the operation.

7.3.1 Use of Supplements for Drilling and/or Completion Operations

If a licensee intends to drill and/or complete a noncritical or critical sour well and the entire proposed sour well EPZ is included within the licensee's sour operations ERP emergency planning zone, the licensee may submit a supplement for approval of those operations in place of a new sour well site-specific drilling and/or completion ERP. In addition, the sour operations ERP has to address emergency response procedures and personnel responsibilities specific to drilling and/or completion operations. Once the ERCB approves the additional information, it becomes an approved supplement to the sour operations ERP.

A new sour well site-specific drilling and/or completion ERP is required if the proposed well EPZ is not entirely within the sour operations ERP emergency planning zone. An exception to this would be if the portion of the well EPZ that lies outside of the sour operations ERP emergency planning zone does not contain surface development. The licensee is allowed to use a supplement in such instances.

7) Regardless of the situation, the licensee must conduct a public involvement program for all members of the public within the proposed well EPZ as defined in Section 4.3.

8) The licensee must ensure that a copy of the approved sour operations ERP and supplement is on site during all drilling and completion operations.

7.3.2 Use of Supplements for Sour Well Workovers, Well Servicing, and Testing

For workovers, well servicing, or testing operations on sour wells that are currently included in an approved sour operations ERP, the licensee may use that ERP for the operation provided that

- the sour operations ERP addresses emergency response procedures and personnel responsibilities specific to the operation,
- the sour operations ERP has up-to-date information on residents within the EPZ of the well, and
- a supplement is submitted for approval in accordance with Table 6, as required.

Table 6. Need for a supplement to a sour operations ERP

	Sour well EPZ falls entirely within the sour operations EPZ		
	Surface development within the well EPZ		**No surface development within the well EPZ**
Critical sour well workover, well servicing, or testing	Supplement required		Supplement required
	Wellhead on	**Wellhead off**	**Wellhead on/off**
Noncritical sour well workover, well servicing, or testing	No supplement required	Supplement required	No supplement required

Licensees are required to submit a new sour well site-specific ERP if

- the sour operations ERP does not have the required information, or
- the entire well EPZ is not included within the sour operations ERP EPZ; an exception to this would be if there is no surface development in the portion of a noncritical well EPZ that lies outside of the sour operations ERP EPZ. The licensee is allowed to use a supplement in such instances.

9) The licensee must ensure that a copy of the approved sour operations ERP and supplement is on site during all workover, testing, or servicing operations.

The licensee is expected to notify those persons holding copies of the supplement and all residents within the EPZ who asked to be notified upon completion of the operation that the supplement is no longer in effect.

Prior to sour well workover, well servicing, or testing operations, on-site activities, such as rigging up and spotting of equipment, may proceed without having the ERP and/or supplement on site.

10) The licensee must not remove any component of the wellhead until the supplement has been approved and is on site.

7.3.3 Supplement Distribution

11) The licensee must provide the government agencies listed in Appendix 5 with a copy of the approved supplement within 10 business days after approval, unless the government agency requests otherwise in writing.

The licensee is expected to keep a copy of the approved sour operations ERP and a copy of the supplement until the updated sour operations ERP captures the content of the approved supplement.

12) The licensee must ensure that all required plan holders have a copy of the approved supplement and a copy of the current sour operations ERP.

8 ERPs for HVP Pipelines

8.1 ERP Submission Requirements

1) The licensee must submit an ERP for approval for any operation listed in Table 7 or for any other situation in which the ERCB determines that a plan is required. As noted in Table 7, surface development within the EPZ determines whether a plan is required.

Table 7. Need for an HVP pipeline ERP

	Surface development within the EPZ	No surface development within the EPZ
HVP pipeline operation	Yes	No
Pipeline maintenance and repair	Yes*	No

* ERP not required if line has been depressured and purged.

2) The licensee must ensure that the ERP is approved by the ERCB before commencement of operations.

The licensee is expected to provide the location of the approved ERP in its plan.

In the event that a licence application requires a public hearing, the licensee is expected to develop and provide an ERP to the ERCB that has been deemed technically complete, prior to issuing a notice of public hearing.

8.2 ERP Content Requirements

This section sets out the ERCB's required content for ERPs associated with HVP pipelines.

3) The licensee must ensure that ERPs for these operations address the requirements in Sections 4 and 5 of this directive and include the following, if relevant to the ERP:

- introduction and summary;
- key licensee contacts, including 24-hour contact phone numbers (the ERCB requires that a call to any of these numbers initiates immediate action);
- appropriate ERCB Field Centre 24-hour emergency phone number;
- brief overview of HVP pipeline operations covered under the ERP;
- general land use, including population density in the area, number of residents, level of transient use, public facilities, and roads;
- date of latest revision;
- pipeline information, which includes
  - routing maps of the pipelines,
  - size and configuration of the EPZ,
  - operational status,
  - licence numbers of the pipelines, and
  - general proximity to the nearest urban centre and residence;
- emergency planning zones for the pipelines; and

- procedures for incident detection, notification, and confirmation, which includes
  - a description of how an emergency will be detected,
  - a description of how the licensee will be alerted of an incident, and
  - a description of how confirmation of a release will occur.

The ERCB may request that supporting documentation for HVP modelling be submitted as part of the audit or ER Assessment Program.

8.3 ERP Supplement

A supplement to an approved ERP may be required for the following:

- addition of new pipelines,
- acquisition of new area operating systems, or
- changes to the EPZ or new residences within the EPZ.

4) As a minimum, the licensee must submit the following additional information in the supplement to the ERCB:
   - complete resident information within the EPZ;
   - supporting information for HVP modelling;
   - copy of public information material;
   - name of new operating area/system, if applicable;
   - pipeline information, which includes
     - location of ESD valves, pipelines, and name and legal description of facilities,
     - maximum licensed operating pressure, and internal diameter of the pipelines,
     - length of pipeline between ESD valves,
     - size of the EPZs for all the pipelines,
     - operational status, and
     - licence numbers of all facilities and pipelines;
   - an EPZ map of the pipelines,
   - a telephone list specific to the operations; and
   - emergency response procedures specific to the operation.

8.3.1 Newly Added Pipeline Tie-ins, Facilities, and Operating Areas

5) The licensee must submit a supplement for review and approval for all newly added pipelines and operating areas prior to commencement of operations if there is new surface development within the EPZ (i.e., the EPZ for the new pipeline or operating area does not fall entirely within the existing HVP pipeline ERP emergency planning zone)

6) The licensee must conduct a public involvement program for all new members of the public as defined in Section 4.3.

8.3.2 Currently Operating System

7) If a currently operating system is added to an HVP pipeline ERP and has surface development within its EPZ, the licensee must submit a supplement for review and approval.

8) The licensee must conduct a public involvement program for all new members of the public as defined in Section 4.3.

8.3.3 Supplement Distribution

9) The licensee must provide the government agencies listed in Appendix 5 with a copy of the approved supplement within 10 business days after approval, unless the government agency requests otherwise in writing.

The licensee is expected to keep a copy of the current approved ERP and a copy of the supplement until the updated HVP pipeline ERP captures the content of the supplement.

10) The licensee must ensure that all required plan holders have a copy of the approved supplement and a copy of the current HVP pipeline ERP.

9 ERPs for Cavern Storage Facilities Storing HVP Product

9.1 ERP Submission Requirements

1) The licensee must submit an ERP for approval for any facility storing HVP product in caverns.

2) The licensee must ensure that the ERP is approved by the ERCB before commencement of operations.

The licensee is expected to provide the location of the approved ERP in its plan.

In the event that a licence application requires a public hearing, the licensee is expected to develop and provide an ERP to the ERCB that has been deemed technically complete, prior to issuing a notice of public hearing.

9.2 ERP Content Requirements

This section sets out the ERCB's required content for ERPs associated with facilities storing HVP product in caverns (cavern storage facilities).

3) The licensee must ensure that ERPs for these operations address the requirements in Sections 4 and 5 of this directive and include the following if relevant to the ERP:

- introduction and summary;
- key licensee contacts, including 24-hour contact phone numbers (the ERCB requires that a call to any of these numbers initiates immediate action);
- appropriate ERCB Field Centre 24-hour emergency phone number;
- brief overview of operations covered under the ERP;
- general land use, including population density in the area, number of residents, level of transient use, public facilities, and roads;
- date of latest revision;
- cavern storage facility and pipeline information, which includes
  - name or legal description of the facility,
  - routing maps of the pipelines,
  - maximum cumulative HVP release volume for the facility and pipelines,
  - size and configuration of the EPZ,
  - operational status,
  - licence numbers of the cavern storage facility and pipelines, and
  - general proximity to the nearest urban centre and residence; and
- procedures for incident detection, notification, and confirmation, which includes
  - a description of how an emergency will be detected,
  - a description of how the licensee will be alerted of an incident, and
  - a description of how confirmation of a release will occur.

The ERCB may request that supporting documentation for HVP modelling be submitted as part of the audit or ER Assessment Program.

9.3 ERP Supplement

A supplement to an approved ERP may be required for the following:

- addition of new operations to the cavern storage facility,
- major modifications to the cavern storage facility that significantly changes the roles and responsibilities of implementing the ERP, or
- significant changes to the EPZ or new residences within the EPZ.

4) As a minimum, the licensee must submit the following additional information in the supplement to the ERCB:
   - complete resident information within the EPZ;
   - supporting information for HVP modelling;
   - copy of public information material;
   - name of new operating area/system;
   - pipelines and/or cavern storage facility information, which includes
     - location of wells, ESD valves, check valves, pipelines, and any addition to the facility,
     - maximum potential HVP release volumes for all pipeline segments within the system,
     - maximum licensed operating pressure, internal diameter, and minimum operating temperature of the pipelines,
     - length of pipeline between ESD valves,
     - size of the EPZs for the pipelines and cavern storage facility,
     - operational status, and
     - licence numbers of the wells, pipelines, and facility;
   - an EPZ map of the pipelines and cavern storage facility;
   - a telephone list specific to the operations; and
   - emergency response procedures specific to the operation.

9.3.1 Newly Added Wells, Pipelines, and Facilities

5) The licensee must submit a supplement for review and approval to the ERCB for all newly added wells, pipelines, and facilities prior to commencement of operations if there is new surface development within the EPZ.

6) The licensee must conduct a public involvement program for all new members of the public as defined in Section 4.3.

9.3.2 Supplement Distribution

7) The licensee must provide the government agencies listed in Appendix 5 with a copy of the approved supplement within 10 business days after approval, unless the government agency requests otherwise in writing.

The licensee is expected to keep a copy of the current approved cavern storage facility ERP and a copy of the supplement until the updated cavern storage facility ERP captures the content of the supplement.

8) The licensee must ensure that all required plan holders have a copy of the approved supplement and a copy of the current ERP.

10 Spill Cooperative Response Plans

10.1 Requirements

A licensee is exempt from the requirement to develop its own spill response plan, purchase spill cleanup equipment, and conduct an annual exercise if it is an active member in good standing of an oil spill cooperative in Alberta for the area where its operations are located. A member in good standing means that annual licensee membership fees are fully paid and that the licensee has met the obligations of that cooperative.[9]

The licensee is expected to assess the risk[10] its operations pose to the environment and be prepared to provide effective response capability in the event of a spill, particularly into moving water.

Spill preparedness requirements apply to

- all wells (except those suspended in accordance with ERCB requirements and gas wells that produce less than 2 m^3/month of hydrocarbon liquids),
- facilities, and
- pipelines transporting liquids and licensed by the ERCB.

A licensee that is not a member of an oil spill cooperative either joins an oil spill cooperative or submits its own spill response plan for its specific local operations to the ERCB for approval.

10.2 Member of an Oil Spill Cooperative

10.2.1 Spill Cooperative Response Plan Contents

The spill response plan addresses a release of any liquid product onto land or water from any well, pipeline, or facility described above. The plan, which may consist of several different manuals,[11] contains the following:

- a description of initial emergency response procedures and actions, as well as information on all contacts and services;
- an inventory of wells, pipelines carrying liquids, and associated facilities;
- topographical maps showing designated spill control points (if applicable), access roads, urban centres, bodies of water (i.e., streams, rivers, lakes), and water supply intakes for municipal and industrial operations, pipelines, wells, and facilities within the operating area;
- roles, responsibilities, and resources to manage the response (the on-scene commander role can be filled with a designated licensee employee or a third party with appropriate expertise);
- policies for worker safety at emergency spill management sites;

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[9] Licensee cooperative obligations are set out in the Western Canada Spill Services Ltd. (WCSS) membership charter on the WCSS Web site www.wcss.ab.ca.

[10] An example of a risk assessment guide for liquid hydrocarbon spills may be found on the WCSS Web site.

[11] A manual may be in written or electronic format.

- inventory and location of response equipment;
- containment and recovery procedures applicable to the type, volume, and nature of the production and time of year; and
- annual training and exercise programs, a record of the training and exercises, and recommendations for continuous improvement.

10.3 Nonmember of an Oil Spill Cooperative

10.3.1 Spill Response Plan Contents

1) The licensee must have an ERCB approved plan in place to address a release of any liquid product onto land or water from any well, pipeline, or facility described in Section 10.1.

The plan is expected to address the following components:

- a description of initial emergency response procedures and actions, as well as information on all contacts and services;
- an inventory of wells, pipelines carrying liquids, and associated facilities;
- topographical maps showing designated spill control points (if applicable), access roads, urban centres, bodies of water (i.e., streams, rivers, lakes), and water supply intakes for municipal and industrial operations, pipelines, wells, and facilities within the operating area;
- roles, responsibilities, and resources to manage the response (the on-scene commander role can be filled with a designated licensee employee or a third party with appropriate expertise);
- policies for worker safety at emergency spill management sites;
- inventory and location of response equipment;
- containment and recovery procedures applicable to the type, volume, and nature of the production and time of year; and
- annual training and exercise programs, a record of the training and exercises, and recommendations for continuous improvement.

The licensee should also include details of any spill response plan expertise provided by third parties, if applicable.

10.3.2 Spill Response Equipment Requirements

2) A licensee that is not a member of an oil spill cooperative must
   - purchase appropriate spill cleanup equipment, considering the type of operations and terrain in which the licensee operates,
   - maintain the equipment in good working order, and
   - store the equipment in the general area where it may be required and ensure immediate access to it.

Part B: Response Requirements for *Directive 071*

11 Corporate-level ERPs

11.1 Requirements

1) If an ERP is not required, the licensee must have an up-to-date copy of the corporate-level ERP (hard copy or electronic) available at a response location(s) in its area of operations.

2) The licensee must review the corporate-level ERP with personnel assigned roles and responsibilities to ensure that it can be properly implemented.

11.1.1 Assessment Matrix for Classifying Incidents

All incidents are classified as an alert or as level-1, -2, or -3 emergencies. Incidents that can be handled on site through normal operating procedures are deemed to be very low risk and are typically defined as an **alert**. Those with low to high risk require a more difficult or complex resolution and are defined as **emergencies**.

3) The licensee must use the Assessment Matrix for Classifying Incidents (Appendix 4) to classify an incident.

This is to ensure that incidents are classified by the petroleum industry throughout the province in a consistent manner that reflects the nature of the hazard and the potential to impact members of the public and the environment. The matrix considers the risk, control, containment, and impact on safety and the environment in arriving at a classification. The initial level of emergency is determined by the licensee in order to immediately communicate and activate internal response resources.

4) The licensee must contact the ERCB immediately after it has communicated and activated internal response resources to confirm the level of emergency and convey the specifics of the incident.

11.1.2 Communications Planning

5) After contacting the ERCB, the licensee must notify the local authority, the RCMP/police, the local RHA, other applicable government agencies,[12] and support services required to assist with initial response if the hazardous release goes off site and has the potential to impact the public or if the licensee has contacted members of the public or the media.

6) The licensee must make the information in Appendix 8 available to the public as soon as possible during an emergency.

Media releases are generated and released as significant developments occur. The licensee is expected to coordinate media releases with the ERCB prior to release to provide consistency and accuracy of information. Information is communicated through written news releases, news conferences, and any other effective means the licensee chooses to use. The licensee is expected to identify a spokesperson to carry out this role and to interact with the ERCB and other applicable government agencies.

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[12] See the *Petroleum Industry Incident Support Plan*, available from the Alberta Emergency Management Agency.

11.1.2.1 Downgrading and Stand-down of Emergency Levels

7) Once the situation improves, the licensee must make the decision to downgrade or stand-down an emergency in consultation with the ERCB. The ERCB will consult with other applicable agencies and confirm with the licensee that the emergency downgrade or stand-down is appropriate.

8) The licensee must keep all notified and evacuated persons and the media informed of the status of an emergency.

11.1.3 Incident Management Systems

During a response where the corporate-level ERP is being used and an EOC is required, the ERCB encourages the formation of a single regional EOC to enhance industry and municipal responses.

12 Emergency Planning and Response Zones

12.1 Emergency Planning Zone

An EPZ is a geographical area surrounding a well, pipeline, or facility containing hazardous product that requires specific emergency response planning by the licensee.

1) During any operation involving H_2S or HVP product, the licensee must ensure that on-site supervisory personnel are aware of the size of the EPZ.

12.2 Emergency Awareness Zone

The EAZ is an area outside of the EPZ where public protection measures may be required. Although the EPZ is the key planning area for the licensee's ERP, there is potential for impacts within and beyond the EAZ during a hazardous release. The initiation of public protection measures in the EAZ and beyond the EAZ is a coordinated response by the local authority and the licensee. The local authority response in the EAZ may be limited to what is described in the municipal emergency plan and the response capacity of the local authority.

12.3 Response Zones

Whereas the EPZ is used for planning purposes and reflects an area where significant exposure could result without prompt action actual conditions during an incident need to be assessed to ensure an appropriate initial response. The response zones are where resources are focused during an incident to protect public safety. A licensee should also be aware that a different type and size of response zone could be established by the RCMP/police if a bomb has been confirmed at a pipeline, well, or facility (i.e., in accordance with existing protocols).

12.3.1 Initial Isolation Zone

The IIZ defines an area in close proximity to a continuous hazardous release where indoor sheltering may provide limited protection due to proximity of release.

2) If safe to do so, the licensee must attempt to evacuate the residents from the IIZ.

12.3.2 Protective Action Zone

Immediately following a release of H_2S or HVP product, the approximate size and direction of the protective action zone (PAZ) can be determined using wind direction, the protective action distance (PAD), and the schematic in Figure 3. The PAD is defined as the distance from the incident to the EPZ outer boundary. Once monitoring equipment arrives, the actual size of the PAZ can be determined based on the monitored conditions.

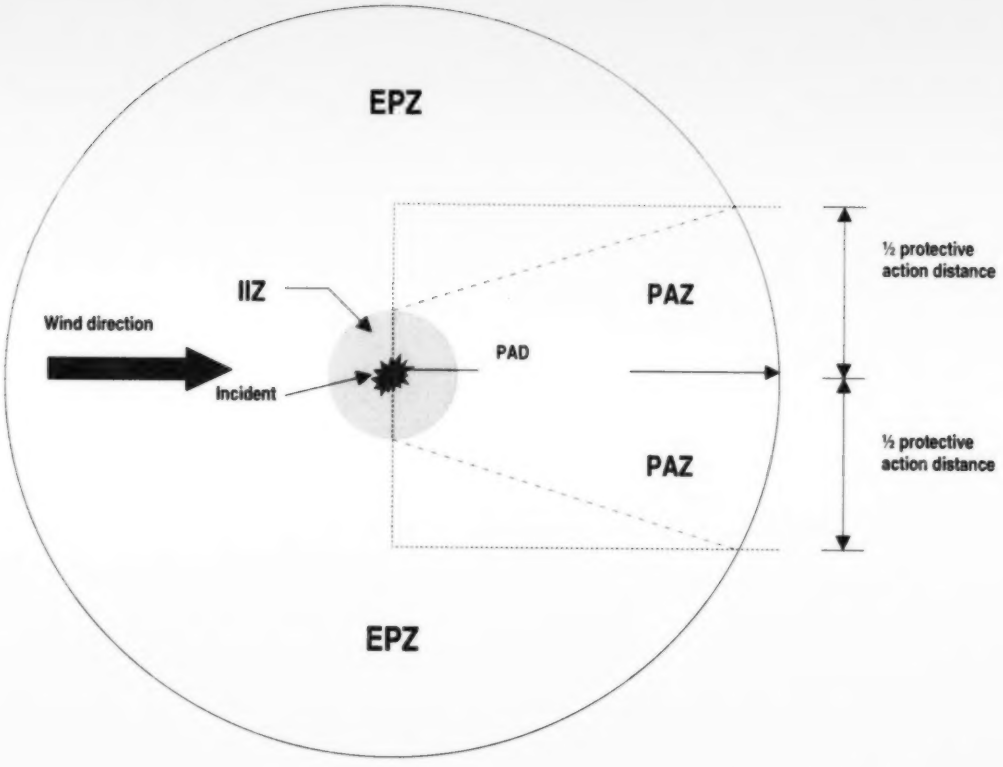

Figure 3. Initial isolation and protective action zones

13 Public and Local Authority Involvement in Emergency Preparedness and Response

13.1 When Are Notification and Consultation Required?

1) The licensee must carry out public and local authority notification and consultation for situations outlined in Table 8.

Table 8. Notification and consultation requirements

Situation	Notification and consultation requirements
Modifications to an existing facility	• **Notification** of and **consultation** with members of the public and the local authority within the EPZ are required if modifications to existing facilities will result in a change to the size of the EPZ or facility procedures.
Prior to entering the first sour zone and prior to nonconsecutive completion operations on a sour well	• **Notification** of members of the public within the EPZ is required at least 24 hours prior to entering the first sour zone for all sour well drilling operations and prior to nonconsecutive completion operations* on a sour well in order to provide sufficient time for members of the public who wish to leave prior to commencement of operations.
Wellhead-off workovers	• **Notification** of members of the public who have indicated during the public involvement program that they wish to leave prior to commencement of operations.
Delayed completion operations	• **Notification** of and **consultation** with members of the public within the EPZ are required prior to completion operations that were not carried out within six months after conclusion of drilling operations.
Transfer of ownership	• **Notification** of members of the public and the local authority within the EPZ is required after finalization of a sales agreement but before the transfer from one licensee to another of wells, pipelines, and facilities requiring an ERP.
Public awareness program	• **Consultation** is required every two years with members of the public within a sour operations, HVP pipeline, or cavern storage facility EPZ through consultative processes to promote continued awareness of emergency response procedures and to address any concerns.
Cancellation of ERP	• The licensee is required to notify residents within the EPZ and the local authority if the ERP has been cancelled.
End of drilling and/or completion operations	• The licensee is expected to ensure that those holding copies of the ERP, residents listed in the ERP, the local ERCB Field Centre, and the ERCB EPA Section are notified at the end of drilling and/or completion operations and advised of the status of the plan.

* Completion operations that take place more than four weeks after the drilling rig has been removed.

14 Common Requirements for ERPs

14.1 ERP Location

1) The licensee must have an up-to-date copy of the ERP (hard copy or electronic) at a response location(s) in its area of operations.

14.2 Assessment Matrix for Classifying Incidents

2) The licensee must use the Assessment Matrix for Classifying Incidents (Appendix 4) to classify an incident.

   This is to ensure that incidents are classified by the petroleum industry throughout the province in a consistent manner that reflects the nature of the hazard and the potential to impact members of the public and the environment. The matrix considers the risk, control, containment, and impact on safety and the environment in arriving at a classification. The initial level of emergency is determined by the licensee in order to immediately communicate and activate internal response resources.

3) The licensee must take appropriate actions, including public protection measures, for each level of emergency.

4) The licensee must contact the ERCB immediately after it has communicated and activated internal response resources to confirm the level of emergency and convey the specifics of the incident.

14.3 Public Protection Measures

It is the licensee's responsibility to initiate public protection measures in the EPZ for any incident involving a release of sour gas or HVP product if there is potential for the release to impact members of the public. This could also include SO_2 if the sour gas release was ignited.

The type of public protection measure employed depends on the severity of the incident and/or on the monitored results in the unevacuated areas. The licensee is responsible for ensuring that appropriate emergency response procedures are in place and can be implemented, including for areas of potential impact beyond the EPZ.

Figure 4 is a decision tree of the public protection measures for planning and response zones.

14.3.1 Notification During an Accidental Release

5) If a sour gas or HVP product release has the potential to impact beyond the lease, facility boundary, or pipeline right-of-way, the licensee must notify
   - the public in the response zones that are within the EPZ,
   - the director of emergency management, if an urban centre is within the EPZ,
   - individuals within the EPZ that have requested early notification and wish to voluntarily evacuate, and
   - the local authority and RHA.

Licensee personnel and/or designated responders may be required to provide evacuation assistance for individuals with an identified special need.

Figure 4. Public protection measures for planning and response zones

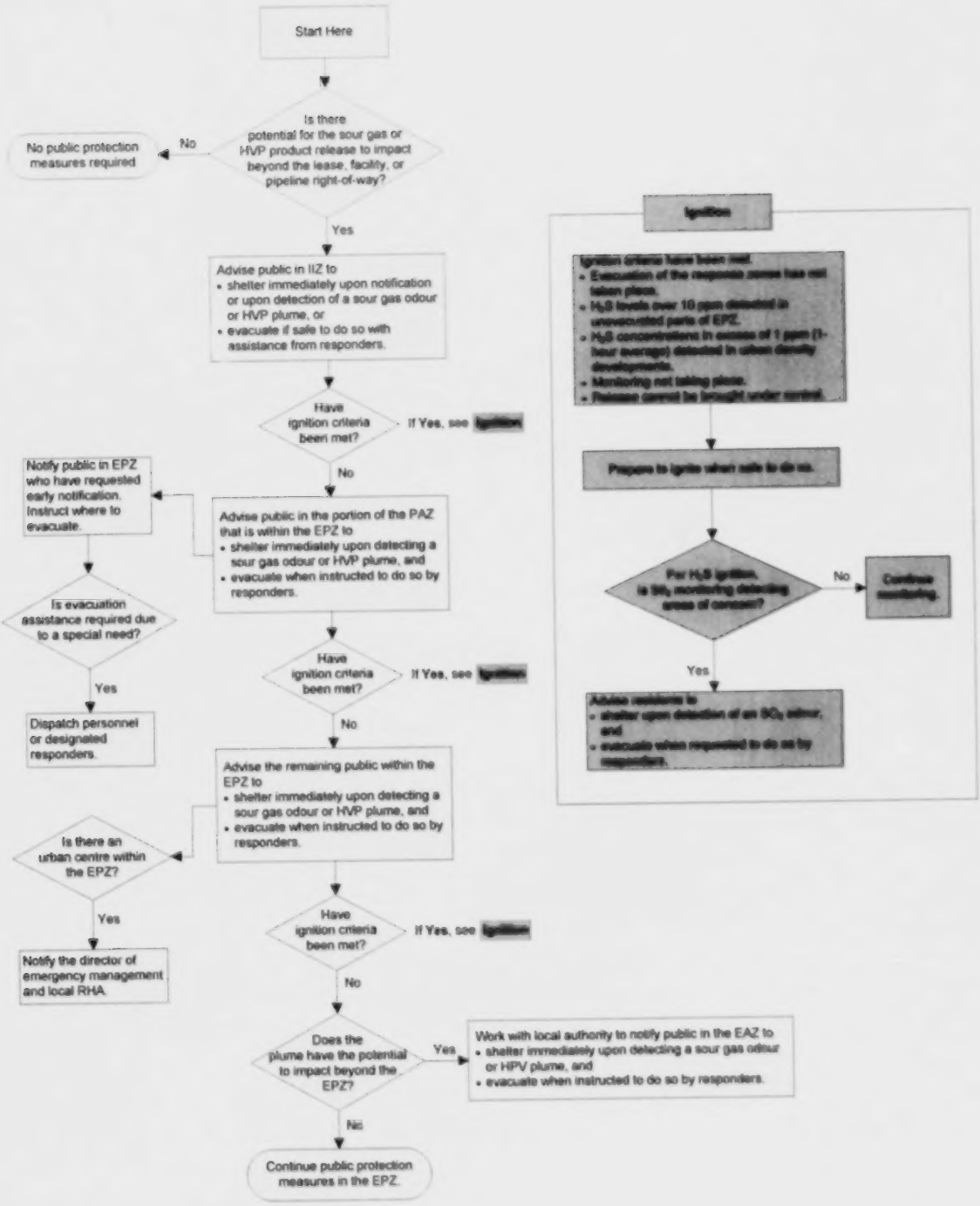

Figure 4. Public protection measures for planning and response zones

6) The licensee must notify the rest of the public in the EPZ as soon as notification attempts have been completed for the public in the response zones.

7) The licensee must advise the public within the EPZ of the appropriate public protection measures.

Notification mechanisms in the MEP may be used by the licensee if that has been agreed upon with the local authority.

14.3.2 Evacuation and/or Sheltering Indoors

When safe to do so, evacuation should take place before a release of sour gas or HVP product has the potential to affect people in proximity to the release or as soon as possible to avoid any exposure to the hazard.

If evacuation is not possible, then sheltering-in-place can be used to protect members of the public under certain conditions.

Depending on the volume, size, duration, or meteorological conditions, sheltering in place may not be a viable public protection measure within the IIZ during an H_2S release. In such a situation, the public safety aspects of sheltering in place will have to be continuously re-evaluated during the incident and assisted evacuation may be necessary to protect public safety.

14.3.3 Public Protection Measures for an H_2S Release

Evacuation is the primary public protection measure during a release of sour gas if the public can be safely removed from the area. Evacuation begins in the IIZ and expands outward into the PAZ downwind of the release so that members of the public are not exposed to H_2S. Evacuation of members of the public within the PAZ is based on the monitored levels of H_2S listed in Appendix 6.

8) The licensee must continuously assess and act on the need to expand the evacuation area based on the monitored levels of H_2S and as dictated by the specifics of the incident itself. In the absence of the ability to take monitored readings, responders should advise residents to shelter in place.

A licensee can advise residents to evacuate; however, the local authority or RHA has to declare a state of local emergency before mandatory evacuation can occur. It is an ERCB requirement for a licensee to advise residents to evacuate if the need arises.

Typically, residents within the EPZ but outside of the PAZ will be contacted and advised to shelter in place pending further instructions from the licensee and/or the local authority, depending on existing arrangements.

A shift in wind direction will require immediate reevaluation of the PAZ and the need for additional evacuation and/or sheltering. It may require immediate ignition of the well if ignition criteria are met. If the sour gas release has been ignited, the licensee should continue to monitor response zones for H_2S from incomplete combustion, as well as SO_2.

14.3.4 Public Protection Measures for an HVP Product Release

Sheltering is the primary public protection measure for an HVP product release. Evacuation of the public should only proceed when it is safe to do so and after an assessment of

- the size and expected duration of the release,
- egress routes,
- current and expected meteorological conditions, and
- the potential for unexpected ignition.

For HVP product releases, the IIZ and PAZ define a region adjacent to a release where plume concentrations may fall within the upper explosive limit and LEL and where the public may be directly exposed to the flame if the plume ignited. For large failure events, this area reaches its maximum extent shortly after initiation of a failure and then declines. Inadvertent actions within this region may lead to ignition; thus sheltering is recommended until the position of the plume can be assessed and evacuation can take place safely.

Evacuation is recommended for incidents in which the plume is visible and egress can occur in any direction away from the plume. A decision to evacuate should be made by qualified individuals with access to LEL monitors.

14.3.5 Notification and Evacuation Outside the EPZ

Notification and evacuation will take place outside the EPZ in accordance with the licensee's arrangement with the local authority. *The Petroleum Industry Incident Support Plan*[13] will also be activated by the government for level-2 and level-3 emergencies to provide support to the incident response. Notification mechanisms outlined in the MEP response framework may be used by the local authority to notify residents if public protection measures are required outside the EPZ. The notification mechanisms will be based on monitored air quality and other situations that might arise during the emergency. Evacuation of the area outside the EPZ is coordinated through the licensee's ERP and the response framework in the local authority's MEP. The RHAs also have a role in evacuation in accordance with the Alberta *Public Health Act*, Section 52.2.

14.3.6 Ignition Criteria

14.3.6.1 Sour Well Releases

Licensees are expected to take immediate steps to prepare for ignition at the earliest signs of a release or a well control problem to ensure there will be no delay. For manned well operations, prompt ignition mitigates the threat of H_2S exposure that could threaten public safety during a major sour gas release. During a sour well control problem, ignition discussions between the licensee and the ERCB should occur at preset intervals until the well is brought under control.

Licensees are required to ensure that all sour wells have an ignition system such as a flare gun on site during all drilling, completion, well testing, or workover operations in the sour zone(s).

Licensees are required to ensure that all critical sour wells have a dual ignition system on site during all drilling operations in the critical zone(s) and during all completion, well testing, or workover operations when the wellhead is off. The primary ignition system should be installed such that remote activation can be achieved from a safe location through a triggering device. The secondary system may be a manual system, such as a flare gun.

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[13] The *Petroleum Industry Incident Support Plan* is available from the Alberta Emergency Management Agency.

9) The licensee must

- keep the local ERCB Field Centre informed about the ignition situation and ignite a sour gas flow to the atmosphere in accordance with the Assessment and Ignition Criteria Flowchart (Appendix 7) unless discussions with the ERCB determine that ignition may be delayed,
- ensure that appropriate ignition equipment is available during all operations, and
- assign the decision-making authority to ignite the release to a licensee representative on site.

The ignition team should be certified in sour well ignition and properly equipped to ignite the well within the planned time limits for which the EPZ was designed. Certification in ignition training may be obtained from Enform[14] or from other training facilities that have a comparable program.

ERCB senior staff may make the decision to ignite a release if the licensee does not agree to ignite the release or is not prepared to take the necessary steps.

Ignition does not negate the need for continuing with evacuation as there may be residual pockets of H_2S or SO_2 in the area.

14.3.6.2 HVP Product Releases from a Pipeline or Cavern Storage Facility

Following an incident, the hazard associated with an HVP product release may be controlled or minimized by deliberately igniting the release. Ignition of an HVP product release should occur only after the position of the plume has been established, after careful deliberation, and when safe to do so.

Until such time that a decision has been made to ignite a release, the licensee should take steps to minimize any chance of unplanned ignition in the area.

10) When making the decision to ignite, the licensee must take the following into consideration:

- the increased risk(s) of delayed ignition,
- whether the perimeter of the hazard area has been established,
- whether the public has been evacuated from the area,
- whether ignition will worsen the situation by endangering the public or the environment or damaging the equipment used to control the product,
- whether wind direction has been established and is it being continually monitored, and
- whether the possibility of an explosion has been assessed (i.e., obstructions or regions of congestion within the perimeter of the dispersing vapour cloud).

11) The licensee must assign the decision-making authority to ignite an HVP product release to a licensee representative on site.

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[14] Enform is a petroleum training institute located in Calgary and Nisku, Alberta.

The ignition team should be certified in HVP product ignition and be properly equipped to ignite the pipeline release within the time limits for which the EPZ was designed. Certification in ignition training may be obtained from Enform or from other training facilities that have a comparable program.

ERCB senior staff may make the decision to ignite a release if the licensee does not agree to ignite the release or is not prepared to take the necessary steps.

14.3.7 Isolation Procedures

During an incident members of the public may be at risk if exposed to the hazard.

12) The licensee must ensure that manned roadblocks are in place to restrict unauthorized entry into the response zones during a sour gas or HVP product release that could potentially jeopardize public safety.

The licensee should be prepared to deal with major highways and railways passing through the EPZ that could be impacted by the hazard.

It may be necessary to obtain a fire hazard order (issued by the ERCB) or to declare a state of local emergency to restrict access to a designated area. A state of local emergency may be declared by the local authority if it decides that it is prudent to do so.

It may also be necessary for NAV CANADA to issue a Notice to Airmen (NOTAM) to advise pilots of restrictions in the airspace above the EPZ or to close the airspace for a certain radius from the release (a no-fly zone). NOTAMs or closure of airspace may be requested by the ERCB at a level-2 or level-3 emergency.

14.3.8 Air Quality Monitoring

14.3.8.1 Sour Gas Release from a Manned Operation

13) For critical sour wells, if the EPZ includes a portion of an urban density development or urban centre, there must be a minimum of two mobile air quality monitors: one to monitor the boundary of the urban density development or urban centre and the other to track the plume. The licensee must also

- ensure that one unit is in the area during drilling and/or completion, testing, and workover operations in potentially critical sour zones,
- ensure that the other unit is dispatched if it is evident that well control measures are deteriorating and that a sour gas release is likely to occur, and
- prior to conducting operations in the sour zone, determine where the monitoring equipment is located and what the estimated travel time is to the well site.

Additional units may be required if there are multiple urban density developments or a large urban centre.

14) For critical sour wells whose EPZ does not include a portion of an urban density development or urban centre and for all noncritical sour wells, the licensee must

- dispatch a mobile air quality monitoring unit(s) when it is evident that well control measures are deteriorating and that a sour gas release is likely to occur, and
- prior to conducting operations in the sour zone, determine where the monitoring equipment is located and what the estimated travel time is to the well site.

Air quality monitoring occurs downwind, with priority being directed to the nearest unevacuated residence or area where people may be present.

The licensee is expected to provide monitored H_2S and SO_2 information on a regular basis throughout a sour gas emergency to Alberta Environment, the ERCB, RHAs, and local authorities and on request to the public.

14.3.8.2 Sour Gas Release from an Unmanned Operation

15) If the licensee is notified of a release by an alarm or by a reported odour, it must investigate the source of the release and send out air quality monitoring units upon confirmation of the release location.

14.3.8.3 HVP Product Release

Monitoring may occur downwind or upwind depending on how the plume is tracking, with priority being directed to the nearest unevacuated residence or areas where people may be present.

The licensee is expected to provide monitored HVP product LEL information on a regular basis throughout the emergency to Alberta Environment, the ERCB, RHAs, and local authorities and on request to the public.

14.4 Equipment Location and Calibration

16) The licensee must ensure that equipment identified in the ERP is available and located where specified in the ERP for any operation.

17) The licensee must ensure that company equipment is operational and the appropriate documentation is available to verify testing and calibration requirements.

The licensee's approved vendor program should ensure that contracted equipment meets industry standards for calibration.

14.5 Communications Planning

18) After contacting the ERCB, the licensee must notify the local authority, RCMP/police, the local RHA, government agencies,[15] and support services required to assist with initial response if the hazardous release goes off site and has the potential to impact the public or if the licensee has contacted members of the public or the media.

19) The licensee must make the information listed in Appendix 8 available to the public as soon as possible during an emergency.

The licensee is expected to coordinate media releases with the ERCB prior to release to allow for consistency and accuracy of information. Information is communicated through written news releases, news conferences, and any other effective means the licensee chooses to use. The licensee should identify a spokesperson to carry out this role and to interact with the ERCB and other applicable government agencies.

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[15] See the *Petroleum Industry Incident Support Plan.*

14.5.1 Downgrading and Stand-down of Emergency Levels

20) Once the situation improves, the licensee must make the decision to downgrade or stand-down an emergency in consultation with the ERCB. The ERCB will consult with other agencies as applicable and confirm with the licensee that the emergency downgrade or stand-down is appropriate.

21) The licensee must keep all affected persons and the media informed of the status of an emergency.

14.6 Plan Management Process

The licensee is responsible for ensuring that its sour operations, HVP pipeline, and cavern storage facility ERPs are maintained regularly and that updates are sent to the ERCB (both the EPA Section and the appropriate ERCB Field Centre) and other plan holders.

The ERCB no longer requires the submission of annual ERP updates for approval, but it is checking ERP accuracy continually using its ER Assessment Program. ERPs that are not current and therefore could result in ineffective emergency response will be subject to enforcement action by the ERCB.

22) The licensee must demonstrate that its plan management process keeps ERPs up to date. A plan management process ensures that

- plans are reviewed and updated on a semiannual basis, if necessary, with changes made to ensure that the information remains accurate; updates could be triggered by some or all of the following:
  - changes to current emergency information,
  - new mapping information—a small map of the affected area showing the changes would be acceptable for a period of one year,
  - new resident information,
  - any changes to response staff information or response capabilities, and
  - facility additions such as well or pipeline tie-ins that do not require submission of a supplement;
- residents are contacted to update their information; and
- ground truthing identifies any changes, such as new residents, businesses, and renters, and verifies the ERP maps—the licensee may use any method for ground truthing.

23) The licensee must conduct a public awareness program every second year with residents within the EPZ through consultative processes. The licensee is expected to

- provide key emergency response information,
- review public protection measures, and
- answer any concerns or questions that residents may have.

Regardless of whether residents wish to meet with the licensee, the licensee is expected to provide an updated public information package to each residence. Some licensees may decide to send out an updated public information package every year depending on

changes in the area. If a resident does not wish to participate in the public awareness program, the licensee is expected to note that in its records.

24) The licensee must distribute changes in information that are instrumental to implementing the ERP to all required plan holders.

25) Errors identified in the ERP by the ERCB, licensee, or other party must be corrected immediately upon identification.

The licensee is expected to update its approved site-specific drilling and/or completion ERP with information about on- and off-site emergency response team personnel prior to commencing drilling operations.

The licensee may have to update the ERP if the ERCB determines that an update is required.

14.7 Incident Management Systems

Whenever an ERP has been activated and an EOC is required, the ERCB encourages combining industry and municipal responses into a single REOC, if possible.

14.8 Reception Centre

For ERPs with a small number of residences in the EPZ, a reception centre may not be necessary if the licensee can demonstrate that the evacuated residents can be managed effectively without one.

26) When evacuation of residents is required, the licensee must

- activate a reception centre located at a safe distance from the release source, and
- meet and register evacuees at the reception centre.

Once evacuees have been registered at the reception centre and have indicated where they may be contacted, they may choose to leave the centre or they may ask for assistance in arranging temporary accommodation.

14.9 Training Sessions

27) The licensee must provide training sessions to ensure that response personnel are competent in emergency response procedures.

The licensee is expected to provide ERP training on

- the overall plan,
- roles and responsibilities during an incident,
- public protection measures used during an emergency, and
- available communication methods.

14.10 Exercise Requirements

28) The licensee must test its ERPs through the following types of planned exercises to promote emergency response preparedness:

- tabletop or communications exercise, held annually for each area ERP, except in a year when a major exercise is held, and

- major exercise, held once every three years for each area ERP.

CAN/CSA Standard Z-731-03, Appendix K, provides guidance in designing and documenting exercises.

In situations where licensees have multiple area ERPs with the same field supervisory response personnel and infrastructure, the ERPs may be tested simultaneously through one exercise.

29) The licensee must

- notify the appropriate ERCB Field Centre 30 days in advance of a scheduled exercise via the ERCB DDS system, and
- invite the local authority, the RHA, or any other government department or agency to participate and/or observe at major exercises.

14.11 Record Keeping

30) The licensee must have a process for recording the following activities:

Incident Records

- information gathered during and following an incident: these records provide documentation to be used for assessment, historical, and analytical purposes (see Appendix 9: First Call Communication Form, which may be used during an incident)

Keeping ERPs Current

- efforts to keep the ERP current, including attempts to contact or obtain the cooperation of any required persons and any outstanding issues yet to be resolved

Training, Meetings, and Exercise Records

- records of staff training
- within 60 days of an exercise, a report of exercise results to be maintained for assessment purposes that includes
  - type of exercise held
  - scope and objectives
  - persons involved
  - outcome (i.e., whether objectives were achieved)
  - lessons learned
  - action plan, including timelines
- documentation of all presour and/or critical sour meetings, such as meeting sign-in sheets, invitations, and minutes for possible review under the ERCB ER Assessment Program

The licensee is expected to retain all records for a period of three years.

14.12 Sale of Property

31) If a well, facility, or pipeline with an ERP has been sold, the new licensee must contact the EPA Section within 30 days of the transfer of licence to discuss a timeframe for submitting a new ERP. The new licensee is also expected to provide notification to the EPA Section at EPAssessment@ercb.ca within 7 working days of the date of the transfer of licence and include an itemized summary of changes, such as

- corporate structure change,
- contact numbers,
- internal communication changes, and
- signing authority changes.

Residents within the EPZ and the local authority should also be notified of the change in ownership and advised that the licensee will be conducting a public involvement program as part of the development of a new ERP.

32) The new licensee must ensure that the emergency response procedures in place will not be compromised prior to approval of the new ERP.

14.13 Overlapping EPZs

Licensees conducting sour drilling and/or completion operations, wellhead-off workovers, or well servicing operations (in any formation containing H_2S that is open to the wellbore) where two or more well operations are in close proximity to one another such that the EPZs overlap are expected to

- jointly confirm whether the EPZs overlap and if sour operations are scheduled to take place simultaneously, and
- establish, maintain, and document communication among the licensees.

The ERCB will not allow **more than two wells** with overlapping EPZs to conduct simultaneous sour drilling and/or completion operations, wellhead-off workovers, or well servicing operations. Companies may ask the ERCB for a revised EPZ based on technical evaluation of the potential release rate. The technical evaluation should consider sour zones that have been isolated behind casing and/or a valid analysis of the H_2S concentration from the zone(s) open to the surface. Procedures for overlapping EPZs are set out in Table 9.

14.14 Presour and Critical Sour Meeting Requirements

Meeting requirements for operations carried out under a sour operations plan or supplement are found in Section 15.1.

Table 9. Procedures for overlapping EPZs

Procedures	Critical sour wells		Noncritical sour wells	
	Surface development	No surface development	Surface development	No surface development
Review and modify ERPs as required (e.g., communication protocol changes).	Yes	Yes	Yes	N/A
Advise appropriate ERCB Field Centre prior to conducting sour operations.	Yes	Yes	Yes	N/A
Maintain communication among licensees.	Yes	Yes	Yes	Yes
During drilling operations, once the first well penetrates approximately 1 m into the critical zone porosity top, the second well may proceed to penetrate the critical zone.*	Yes	Yes	N/A	N/A
If both wells are conducting sour operations and an emergency level is declared at either well, the second well suspends operations until the emergency is over.	Yes	No	Yes	No

* This could be a standalone zone or a combination of zones that makes the well a critical sour well.

15 Sour Well Site-specific Drilling and/or Completion ERPs

15.1 Presour and Critical Sour Meeting Requirements

1) For all noncritical or critical sour drilling and/or completion, workover, and well servicing operations, the licensee must conduct a meeting within 96 hours (4 days) prior to entering the first sour zone to identify hazards associated with the operation, review roles and responsibilities, and assess on-site personnel capabilities required to implement the ERP. Those required at the meeting include

   - field response personnel with assigned roles and responsibilities in the ERP, and
   - key personnel involved in supervision and management of the emergency response activities.

The licensee may have to schedule additional meetings for those who were not present at the initial meeting.

2) If drilling and/or completion, workover, or well servicing operations include a critical sour zone or a combination of zones that makes the well a critical sour well, the licensee must conduct a critical sour meeting prior to entering that zone.

   As a minimum, each meeting should include the following:

   - verification of the assigned roles and responsibilities as set out in the ERP,
   - identification of any revisions to the ERP,
   - confirmation that the emergency contact numbers are correct, and
   - communication of EPZ information to well site personnel.

3) The licensee must advise the appropriate ERCB Field Centre 24 hours in advance of a presour meeting and provide at least 4 business days' prior notice of a critical sour zone meeting so that schedules may be adjusted to facilitate attendance.

4) The licensee must provide at least 4 business days' prior notice to the local authority, RHA, and other applicable government departments and agencies of the critical sour zone meeting so that they may elect to participate.

Meetings for noncritical wells do not require the involvement of government departments and agencies other than the ERCB.

15.2 Equipment Requirements for Critical Sour Well Operations

15.2.1 Conducting Operations

5) The licensee must ensure that for critical sour well drilling and/or completion operations, the equipment identified in the ERP is located where specified in the ERP prior to entering the critical sour zone.

6) The licensee must ensure that for critical sour well completion, testing, well servicing, or workover operations, the equipment identified in the ERP is located where specified in the ERP prior to conducting the operation.

15.2.2 Release of Equipment

The equipment identified in the ERP may be released from a location when

- the rig has been released,
- the wellbore is isolated with casing and cement and the well is not perforated, or
- the wellhead is on.

16 Spill Cooperative Response Plans

16.1 Member of an Oil Spill Cooperative

16.1.1 Spill Training Exercises and Notification Requirements

1) As part of its spill response training, a licensee that is a member of a spill cooperative must

   - attend[16] and be appropriately represented at a minimum of one cooperative annual exercise in the area where its operations are located; attendance at an exercise held outside of the area in which the licensee operates facilities is considered satisfactory, provided that the administrator of each spill cooperative involved is notified in advance for tracking purposes; or
   - have an area representative complete a spill response course, self-study spill responder course, or on-scene spill commander course from a recognized training institution in lieu of attendance at an oil spill cooperative exercise; this option cannot be used in consecutive years by the licensee; further, if the option of taking a course in lieu of exercise attendance has been used, the licensee needs to notify the local oil spill cooperative administrator in advance for tracking purposes.

The oil spill cooperative may choose between conducting an annual deployment or a tabletop exercise, depending on the training needs for each area.

2) The spill cooperative must notify the appropriate ERCB Field Centre in writing at least 30 days in advance of a spill equipment deployment training exercise or a tabletop exercise and include the following information:

   - the type of training exercise, the date on which it will be conducted, and the legal description of the land on which it will be conducted;
   - a map showing the general topography, location of and access routes to the deployment area, and the location of any municipal water intakes within 3 kilometres (km) of the deployment area;
   - the proposed spill material and volume to be used, if any (any liquid spill medium used in the exercise has to be edible canola oil or mineral oil, dyed with an innocuous dye that harms neither water quality nor flora and fauna);
   - comments on the public use of the area, the collection and disposal of garbage, and a statement indicating the extent, if any, of anticipated surface disturbance to stream banks or shorelines at the test site; and
   - the name of the landowner on whose land the training exercise will be held, and confirmation that the landowner is agreeable to the exercise proceeding at the proposed test site.

A licensee or licensee representative attending an exercise is allowed to represent a maximum of four companies unless there is preapproval to represent additional companies from the cooperative chairman.

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[16] Attendees are required to achieve 70 per cent or better on a written exercise quiz to achieve credit for the exercise.

The following outlines the notification practices for spill equipment deployment training exercises:

- If the exercise is to be held on Crown lands, the oil spill cooperative is required to submit written notification to the appropriate Crown office (Public Lands or Forest Area) 30 days in advance of the exercise. A copy of the notification should be kept on site during the exercise.
- If the exercise involves private lands, an access agreement between the landowner and the spill cooperative is required.

16.1.2 Training Exercise Report Summaries

3) The spill cooperative must complete the training exercise report summary within 30 days following the training exercise and make it available to the ERCB upon request for a period of two years following each training exercise.

A licensee of wells, pipelines carrying liquids, or facilities that fails to maintain its membership in good standing in an oil spill cooperative for the purposes of this directive will be considered a nonmember of the oil spill cooperative. A list of nonattending licensees will be forwarded to the ERCB Public Safety/Field Surveillance Branch.

16.2 Nonmember of an Oil Spill Cooperative

16.2.1 Spill Training Exercises and Notification Requirements

4) A licensee that is not affiliated with a local spill cooperative must conduct its own exercise in the area where its operations are located.

The licensee may choose between conducting an annual deployment training exercise or a tabletop exercise, depending on the training needs for each area. A tabletop exercise cannot be used in consecutive years.

5) The licensee must demonstrate the same competencies as an oil spill cooperative member.

6) The licensee must notify the appropriate ERCB Field Centre in writing at least 30 days in advance of the spill equipment deployment training exercise or tabletop exercise and include the following information:

   - the type of training exercise, the date on which it will be conducted, and the legal description of the land on which it will be conducted;
   - a map showing the general topography, location of and access routes to the deployment area, and the location of any municipal water intakes within 3 km of the deployment area;
   - the proposed spill material and volume to be used, if any (any spill medium used is required to be edible canola oil or mineral oil, dyed with an innocuous dye that harms neither water quality nor flora and fauna);
   - comments on the public use of the area, the collection and disposal of garbage, and a statement indicating the extent, if any, of anticipated surface disturbance to stream banks or shorelines at the test site; and

- the name of the landowner on whose land the training exercise will be held, and confirmation that the landowner is agreeable to the exercise proceeding at the proposed test site.

The following outlines the notification practices for spill equipment deployment training exercises:

- If the exercise is to be held on Crown lands, the licensee submits written notification to the appropriate Crown office (Public Lands or Forest Area) 30 days in advance of the exercise. A copy of the notification should be kept on site during the exercise.
- If the exercise involves private lands, an access agreement between the landowner and the licensee is required.

16.2.2 Training Exercise Report Summaries

7) The licensee must complete the training exercise report summary within 30 days following the training exercise and make it available to the ERCB upon request for a period of two years following each training exercise.

Appendix 1 Definitions for the Purposes of *Directive 071*

Adjacent to	Within 25 m.
Air quality monitoring	Measurement of atmospheric concentrations of a hazardous substance, such as H_2S or SO_2.
Alert	An incident that can be handled on site by the licensee through normal operating procedures and is deemed to be a very low risk to members of the public.
Best practices	A technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one's disposal to ensure success.
Body of water	Streams, lakes, and rivers.
Consequence Management Officer (CMO)	A position held by individuals under the *Emergency Management Act*.
Consultative processes	Methods of communicating with members of the public that are acceptable to the ERCB, including face-to-face meetings, e-mail, registered or regular mail, telephone, and open houses.
Corporate-level ERP	Those plans prepared by a licensee under the *Oil and Gas Conservation Act*, *Pipeline Act* or any other regulation, statute, or condition imposed by the ERCB. A corporate-level ERP is used when a specific ERP is not required and contains preplanned procedures that will allow for effective response to an emergency. Section 2 of this directive contains the requirements for a corporate-level ERP.
Critical sour well	A well with an H_2S release rate greater than 2.0 m^3/second or wells with lower H_2S release rates in close proximity to an urban centre as defined in *ID 97-6: Sour Well Licensing and Drilling Requirements*.
Emergency	A present or imminent event outside the scope of normal operations that requires prompt coordination of resources to protect the health, safety, and welfare of people and to limit damage to property and the environment
Emergency awareness zone (EAZ)	A distance outside of the EPZ where public protection measures may be required due to poor dispersion of the hazard.
Emergency operations centre (EOC)	An operations centre established in a suitable location to manage the larger aspects of an emergency. In a high-impact emergency, there may be a number of EOCs established to support the response. These may include the ERCB Field Centre incident command post, regional and corporate EOCs, a municipal EOC (MEOC), and the provincial government EOC (GEOC).
Emergency planning zone (EPZ)	A geographical area surrounding a well, pipeline, or facility containing hazardous product that requires specific emergency response planning by the industrial operator.

Emergency response plan (ERP)	A comprehensive plan to protect the public that includes criteria for assessing an emergency situation and procedures for mobilizing response personnel and agencies and establishing communication and coordination among the parties.
ERCBH2S	A software program that calculates site-specific EPZs using thermodynamics, fluid dynamics, atmospheric dispersion modelling, and toxicology.
Evacuation	Organized, phased, and supervised withdrawal of members of the public from dangerous or potentially dangerous areas to safe areas.
Facility	Any building, structure, installation, equipment, or appurtenance over which the ERCB has jurisdiction and that is connected to or associated with the recovery, development, production, handling, processing, treatment, or disposal of hydrocarbon-based resources or any associated substances or wastes. This does not include wells or pipelines.
Fire hazard order	An order issued by the ERCB during an emergency to restrict public access to a specified area.
Gathering system	The network of pipelines, pumps, tanks, and other equipment that carries oil and gas to a processing plant or to other separation equipment.
Government emergency operations centre (GEOC)	An operations centre with the capacity to accommodate representatives from each government department. It consists of two centres, the consequence management operations centre (COMOC) and the crisis management operations centre. The GEOC was formerly known as the Emergency Management Alberta Operations Centre and before that as COMOC.
Hazard	A situation with potential to harm persons, property, or the environment.
Hazardous product	A substance released in quantities that may harm persons, property, or the environment.
High vapour pressure (HVP) pipeline	A pipeline system conveying hydrocarbons or hydrocarbon mixtures in the liquid or quasi-liquid state with a vapour pressure greater than 110 kilopascals absolute at 38°C, as determined using the Reid method (see ASTM D 323).
Hydrogen sulphide (H_2S)	A naturally occurring gas found in a variety of geological formations and also formed by the natural decomposition of organic matter in the absence of oxygen. H_2S is colourless, has a molecular weight that is heavier than air, and is extremely toxic. In small concentrations, it has a rotten egg smell and causes eye and throat irritations. Depending on the particular gaseous mixture, gas properties, and ambient conditions, a sour gas release may be • heavier than air (dense), so it will tend to drop towards the ground with time, • lighter than air (buoyant), so it will tend to rise with time, or • about the same weight as air (neutrally buoyant), so it will tend to neither rise nor drop but with time disperse.

Incident	An unexpected occurrence or event that requires action by emergency personnel to prevent or minimize the impacts on people, property, and the environment.
Incident classification	A system that examines the risk level to members of the public following an incident and assigns a level of emergency based on the consequence of the incident and the likelihood of the incident escalating (see Appendix 4).
Initial isolation zone (IIZ)	An area in close proximity to a continuous hazardous release where the public may be exposed to dangerous and life threatening outdoor pollutant concentrations and indoor sheltering may provide limited protection due to the proximity of the release.
Incident management system	A system used to coordinate preparedness and incident management.
Level-1 emergency	There is no danger outside the licensee's property, there is no threat to the public, and there is minimal environmental impact. The situation can be handled entirely by licensee personnel. There will be immediate control of the hazard. There is little or no media interest.
Level-2 emergency	There is no immediate danger outside the licensee's property or the right-of-way, but there is the potential for the emergency to extend beyond the licensee's property. Outside agencies must be notified. Imminent control of the hazard is probable but there is a moderate threat to the public and/or the environment. There may be local and regional media interest in the event.
Level-3 emergency	The safety of the public is in jeopardy from a major uncontrolled hazard. There are likely significant and ongoing environmental impacts. Immediate multi agency municipal and provincial government involvement is required.
Licensee	The responsible duty holder as specified in legislation.
Local authority	A local authority is considered to be 1) the council of a city, town, village, or municipal district; 2) in the case of an improvement district or special area, the Minister of Municipal Affairs; 3) the settlement council of a Métis settlement; or 4) the band council of a First Nations reserve.
Lower explosive limit (LEL)	The lowest concentration of gas or vapour (per cent by volume in air) that explodes if an ignition source is present at ambient temperatures.
Major exercise	As described in *CAN/CSA-Z731-03*, an exercise involving emergency response agencies and the licensee that entails the deployment of all resources required to test the licensee's ERP. It is intended to provide a realistic simulation of an emergency response.
Mobile air quality monitoring	Use of sophisticated portable equipment to track substances such as H_2S or SO_2 at very low parts per billion atmospheric concentrations.

Municipality	See Local authority.
Municipal emergency plan	The emergency plan of the local authority required under Section 11 of the *Emergency Management Act*.
Mutual aid understanding	An understanding between two or more public and/or private parties, such as oil and gas companies, service companies, and local authorities, that defines each party's commitment to provide aid and support during an incident.
NAV Canada	Canada's civil air navigation services provider, with operations coast to coast. NAV Canada provides air traffic control, flight information, weather briefings, aeronautical information services, airport advisory services, and electronic aids to navigation.
Notification	The distribution of project-specific information to participants that may be directly and adversely affected by the proposed energy development.
On-site command post	An emergency operations centre established in the immediate vicinity of the incident to provide immediate and direct response to the emergency and initially staffed by licensee personnel.
Personal consultation	Consultation through face-to-face visits or telephone conversations with all requisite individuals.
Petroleum industry	Refers to all petroleum industry operations that fall under *Directive 056*.
Protective action zone (PAZ)	An area downwind of a hazardous release where outdoor pollutant concentrations may result in life threatening or serious and possibly irreversible health effects on the public.
Protective action distance (PAD)	The distance from the incident to the EPZ outer boundary.
Public	The group of people who are or may be impacted by an emergency.
Public facility	A public building, such as a hospital, rural school, or major recreational facility, situated outside of an urban centre that can accommodate more than 50 individuals and/or that requires additional transportation to be provided during an evacuation.
Public protection measures	The use of sheltering, evacuation, ignition, and isolation procedures to mitigate the impact of a hazardous release on members of the public.
Publicly used development	Places where the presence of 50 individuals or less can be anticipated (e.g., places of business, cottages, campgrounds, churches, and other locations created for use by the nonresident public).
Reception centre	A centre established to register evacuees for emergency shelter, to assess their needs, and, if temporary shelter is not required because evacuees will stay elsewhere, to ascertain where they can be contacted.

Regional emergency operations centre (REOC)	An operations centre established in a suitable location to manage the larger aspects of the emergency that is manned jointly by government and industry staff.
Residence	A dwelling that is occupied full time or part time.
Response zones	The IIZ and PAZ.
Shelter in place	Remaining indoors for short-term protection from exposure to toxic gas releases.
State of local emergency	A declaration by a local authority under the *Emergency Management Act* or by the medical officer of health under the *Public Health Act* providing the necessary authority, resources, and procedures at the municipal level to allow an emergency to be resolved effectively and efficiently.
Sour gas	Natural gas, including solution gas, containing hydrogen sulphide (H_2S).
Sour pipeline	Pipeline that conveys gas and/or liquid that contains sour gas.
Sour production facility	Facility that processes gas and/or liquid that contains sour gas.
Sour well	An oil or gas well expected to encounter during drilling formations bearing sour gas or any oil or gas well capable of producing sour gas.
Special needs	Those persons for whom early response actions must be taken because they require evacuation assistance, requested early notification, do not have telephones, require transportation assistance, have a language or comprehension barrier, or have specific medical needs. Special needs also include those who decline to give information during the public consultation process and any residences or businesses where contact cannot be made.
Standing well	A well that has been drilled and cased but not perforated. A company is generally allowed to leave the well as standing for up to one year.
Sulphur dioxide (SO_2)	A colourless, water-soluble, suffocating gas formed by burning sulphur in air; also used in the manufacture of sulphuric acid. SO_2 has a pungent smell similar to a burning match. SO_2 is extremely toxic at higher concentrations. The molecular weight of SO_2 is heavier than air; however, typical releases are related to combustion, which makes the gaseous mixture lighter than air (buoyant).
Surface development	Dwellings that are occupied full time or part time, publicly used development, public facilities, including campgrounds and places of business, and any other surface development where the public may gather on a regular basis. Surface development includes residences immediately adjacent to the EPZ and those from which dwellers are required to egress through the EPZ.
Tabletop exercise	As described in *CAN/CSA-Z731-03*, an informal exercise generally used to review resource allocations and roles and responsibilities of personnel and to familiarize new personnel with emergency operations without the stress and time constraints of a major exercise.

Technically complete ERP	A plan that meets all applicable requirements within this directive.
Urban centre	A city, town, village, summer village, or hamlet with no fewer than 50 separate buildings, each of which must be an occupied dwelling, or any similar development the ERCB may designate as an urban centre.
Unrestricted country development	Any collection of permanent dwellings situated outside of an urban centre and having more than eight permanent dwellings per quarter section; for the purpose of applying the requirements of *ID 97-6*, includes any similar development that the ERCB might so designate.
Urban density development	Any incorporated urban centre, unincorporated rural subdivision, or group of subdivisions with no fewer than 50 separate buildings, each of which must be an occupied dwelling, or any other similar development the ERCB may designate as an urban density development.
Well servicing	The maintenance procedures performed on a producing or injecting well after the well has been completed and operations have commenced. Well servicing activities are generally conducted to maintain or enhance well productivity or injectivity.
Workover	The process of reentering an existing well to perform remedial action that will restore or improve the productivity or injectivity of the target formation.

Appendix 2 ERP Approval Application

This appendix provides the licensee with the ERP Approval Application form and instructions on how to complete the form. The licensee is responsible for all aspects of ERP development, including the development of emergency response procedures.

All relevant sections on the form must be filled in. An ERP is submitted as either routine or nonroutine based on the responses entered on the approval form. **If you check a bold response the ERP is nonroutine**. Nonroutine ERPs are classified as either self-identified nonroutine or ERCB-designated nonroutine. For all nonroutine ERPs, the licensee must submit the supporting information indicated in the "How to Complete the ERP Approval Application" section.

The ERCB may designate any routine ERP application as nonroutine under the following circumstances:

- the application contains inconsistent technical information,
- the ERP is related to a facility application proceeding to a hearing,
- the EPZ is located within an area known to have outstanding public safety concerns,
- the EPZ is located within an environmentally sensitive area, or
- any other circumstance the ERCB deems appropriate.

If this occurs, the licensee is advised of the change and the reasons for the nonroutine designation and is directed to address the concerns outlined by the ERCB.

All critical, HVP pipeline, and HVP cavern storage facility ERPs are deemed to be nonroutine by the ERCB and will undergo a full review by an EPA assessor prior to approval.

The licensee is reminded of the need for timely submission of the ERP Approval Application form. The EPA Section reviews forms in the order received. Once an ERP is approved by the ERCB, the licensee bears responsibility for its implementation, including emergency response actions conducted on its behalf by contracted personnel.

ERCB Energy Resources Conservation Board

Directive 071
ERP Application Form

The applicant certifies that the information here and in all supporting documentation is correct and that the contents of the ERP are in accordance with all requirements. False or erroneous information may result in enforcement action in accordance with *Directive 019*.

If you check a BOLD response, the ERP application is nonroutine. For a nonroutine application, you must attach supporting information.

1. REGISTRATION

DDS ERP Plan Reference No.: _____ Submission date: Month_____ Day_____ Year_____

Is the ERP attached to this application form? YES ☐ NO ☐

ERP name: _____ Applicant's reference: _____

Applicant name: _____ Applicant BA code: _____

Contact person: _____

Telephone: _____ Fax: _____ E-mail: _____

Consultant name: _____ Consultant BA code: _____

Consultant contact: _____

Telephone: _____ Fax: _____ E-mail: _____

2. ERP INFORMATION

Type of ERP

Critical ☐ Noncritical ☐ N/A ☐

Site-specific: Drilling ☐ Completions ☐ Servicing/workover ☐ Multiwell ☐

Operational: Sour production ☐ **HVP pipeline** ☐ **HVP cavern storage facility** ☐ **Other** ☐ Corporate ☐

Supplement: Operating area ☐ Tie-in ☐ Sour well ☐

Replacing an existing ERP ☐ Previous ERP name: _____

General ERP Information

Size of largest EPZ: _____ km

Nearest urban centre: _____

Proximity to nearest urban centre: _____ km

Total number of surface developments: _____

Is there an urban centre, urban density development, or public facility within the EPZ? _____ YES ☐ NO ☐

Well, Pipeline, or Facility Information *(fill in appropriate section below)*

Well Information

Well name: _____

Unique well identifier: ____/____ - ____ - _____ - ____W ____ / ____

Well Licence No.: _____

Maximum H_2S: _____ mol/kmol

Maximum H_2S release rate: _____ m^3/s

Pipeline Tie-in Information

Pipeline Licence No.: _____

Maximum H_2S: _____ mol/kmol

Maximum H_2S release volume: _____ m^3

(continued)

Sour Production Facility Information

Maximum H_2S: _____ mol/kmol

Maximum H_2S release rate: _____ m^3/s

Maximum H_2S release volume: _____ m^3

Required for all plans:

3. EMERGENCY PLANNING AND RESPONSE ZONES

1. Has the EPZ been modified? ..... YES ☐ NO ☐
2. Has a copy of the CSV batch export file from ERCBH2S been submitted? ..... YES ☐ N/A ☐

4. CONSULTATION AND NOTIFICATION REQUIREMENTS

1. Have the consultation and notification requirements been met in accordance with Section 4 and Section 13? ..... YES ☐ **NO** ☐
2. Are there any ERP-related objections or concerns associated with the *Directive 056* or *Directive 071* application? ..... **YES** ☐ NO ☐ N/A ☐

5. COMMON REQUIREMENTS FOR ERPS

1. Does the ERP contain the required content in accordance with Section 5 and Section 14? ..... YES ☐ **NO** ☐
2. Have the public protection measures in Section 5.2 and Section 14.2 been addressed and included in the ERP? ..... YES ☐ **NO** ☐
3. Have the mapping requirements in Section 5.3 been met? ..... YES ☐ **NO** ☐
4. Is mutual aid required to implement the ERP? ..... YES ☐ NO ☐
5. Have communication procedures been established and detailed in accordance with Section 5.8? ..... YES ☐ **NO** ☐
6. Have the roles and responsibilities of emergency response personnel been identified in accordance with Section 5.9? ..... YES ☐ **NO** ☐
7. Are the personnel trained and capable of carrying out their respective responsibilities? ..... YES ☐ **NO** ☐

6. REQUIREMENTS FOR SOUR WELL SITE-SPECIFIC DRILLING AND COMPLETION ERPS

1. Does the ERP contain the required content in accordance with Section 6 and Section 15? ..... YES ☐ **NO** ☐
2. Will a temporary surface pipeline be used for in-line testing? ..... YES ☐ NO ☐
3. Will any part of the drilling operation be underbalanced? ..... **YES** ☐ NO ☐

7. REQUIREMENTS FOR SOUR OPERATIONS ERPS AND SUPPLEMENTS

1. Does the ERP contain the required content in accordance with Section 7? ..... YES ☐ **NO** ☐
2. Does the supplement contain all the required information in accordance with Section 7.3? ..... YES ☐ **NO** ☐ N/A ☐
3. Name and ERP Plan Reference No. of the ERP this supplement is linked to: _____

8. REQUIREMENTS FOR HVP PIPELINE ERPS AND SUPPLEMENTS

1. Does the ERP contain the required content in accordance with Section 8? ..... YES ☐ **NO** ☐
2. Does the supplement contain all the required information in accordance with Section 8.3? ..... YES ☐ **NO** ☐ N/A ☐
3. Name and ERP Plan Reference No. of the ERP this supplement is linked to: _____

(continued)

9. REQUIREMENTS FOR CAVERN STORAGE FACILITY ERPS AND SUPPLEMENTS

1. Does the ERP contain the required content in accordance with Section 9.1? ..... YES ☐ NO ☐
2. Does the supplement contain all the required information in accordance Section 9.3? ..... YES ☐ NO ☐ N/A ☐
3. Name and ERP Plan Reference No. of the ERP this supplement is linked to: _____

10. SPILL COOPERATIVE MEMBERSHIP

1. Are you a member of an oil spill cooperative? _____ YES ☐ NO ☐

   If yes, which one? _____

11. ERCB USE ONLY

The above information confirms that this application meets the requirements of *Directive 071.* ..... YES ☐ NO ☐

The application for this ERP is approved. ..... YES ☐ NO ☐

Reviewed by: _____ Date: _____

How to Complete the ERP Approval Application

Step 1: Registration

If you check a **BOLD** *response, the application is nonroutine.*

DDS ERP Plan Reference No.

Enter the Plan Reference No. assigned by the DDS system.

Submission Date

Enter the date the plan was registered through the DDS system.

Is the ERP attached to this application form?

YES means the ERP has been submitted with the application form.

NO means the ERP has not been submitted with the application form.

Any application form submitted without the ERP will be closed and returned to the sender. Any ERPs submitted without the application form will be closed and returned to the sender.

ERP Name

Enter the title of the ERP.

Applicant's Reference

Enter your own file reference in the designated area (optional).

Applicant Name

Enter the full corporate name of the applicant. The ERP must be registered using the same corporate name as the *Directive 056* application.

Applicant BA Code

Enter the 4-digit business associate (BA) code issued to your company by the ERCB.

Contact Person, Telephone, Fax, and E-mail

Enter the name and contact information of the person who can be contacted regarding this ERP.

Consultant Name

Enter the full corporate name of the consultant submitting the application on your company's behalf.

Consultant BA Code

Enter the 4-digit BA code issued to the consultant company by the ERCB.

Consultant, Contact, Telephone, Fax, and E-mail

Enter the name and contact information of the person at the consultant company who can be contacted regarding this ERP.

Step 2: ERP Information

Type of ERP

If you check a **BOLD** response, the application is nonroutine. For each application, you must indicate whether it is critical, noncritical, or not applicable.

Check the appropriate box to indicate the type of ERP.

Replacing an Existing ERP

Check the box if this ERP is replacing an existing ERP and also enter the name of the previous ERP.

General ERP Information

Size of Largest EPZ

For a single well site-specific ERP, enter the size of the EPZ as calculated by ERCBH2S.

For a multiwell site-specific ERP, enter the size of the largest EPZ as calculated by ERCBH2S.

For a sour production ERP, enter the size of the largest EPZ (well or pipeline) contained in the ERP as calculated by ERCBH2S.

ERP Supplement

- For a well tie-in, enter the size of the EPZ as calculated by ERCBH2S.
- For a pipeline tie-in, enter the size of the EPZ as calculated by ERCBH2S.
- For an operating area tie-in, enter the size of the largest EPZ (well or pipeline) as calculated by ERCBH2S.

For an HVP pipeline ERP, enter the size of the largest EPZ.

For an HVP cavern storage facility ERP, enter the size of the EPZ.

For any other type of ERP, enter the size of the largest EPZ. You must submit documentation detailing how the EPZ was calculated.

Nearest Urban Centre

Enter the name of the urban centre nearest to or within the EPZ.

Proximity to Nearest Urban Centre

Enter the distance in kilometres to the nearest urban centre. For a site-specific ERP, the proximity to nearest urban centre is measured from the well itself. For a sour operation ERP (e.g., production facilities), the proximity to urban centre is measured from the main facility within the EPZ.

Total Number of Surface Developments

Enter the number of surface developments located in the EPZ. Surface developments can include, but are not limited to, permanent dwellings, manned facilities, public facilities, and trapper cabins. Refer to Appendix 1 for a definition of surface development.

Is there an urban centre, urban density development, or public facility within the EPZ?

YES means there is an urban centre, urban density development, or public facility within the EPZ.

- The EPA assessor may review the section of the ERP addressing specific response measures for the urban centre, urban density development, or public facility.

NO means there is no urban centre, urban density development, or public facility within the EPZ.

Well, Pipeline, or Facility Information

Well Information—*Complete this section if you have a sour well site-specific or sour well tie-in ERP.*

Well Name

Enter the name of the well as it currently or will appear on the licence.

Unique Well Identifier

Enter the unique well identifier (UWI) assigned by the ERCB. If a licence has not yet been obtained for the well, enter the anticipated UWI using the Dominion Land Survey system.

Well Licence No.

Enter the well licence number assigned by the ERCB. If a licence has not yet been obtained for the well, leave the field blank.

Maximum H_2S — Enter the maximum H_2S concentration anticipated in moles per kilomole (mol/kmol).

Maximum H_2S Release Rate — Enter the maximum H_2S release rate in cubic metres per second (m^3/s). This must be consistent with any approved presubmission rates.

Pipeline Tie-in Information—*Complete this section if you have a pipeline tie-in ERP.*

Pipeline Licence No. — Enter the pipeline licence number as assigned by the ERCB. If a licence has not yet been obtained, leave the field blank.

Maximum H_2S — Enter the maximum H_2S content in the gaseous phase in moles per kilomole as it currently or will appear on the pipeline licence.

Maximum H_2S Release Volume — Enter the maximum H_2S release volume of the pipeline in cubic metres.

Sour Production Facility Information—*Complete this section if you have a sour production facility ERP.*

Maximum H_2S — Enter the maximum H_2S content within the gathering system in moles per kilomole.

Maximum H_2S Release Rate — Enter the maximum H_2S release rate within the gathering system in cubic metres per second.

Maximum H_2S Release Volume — Enter the maximum H_2S release volume within the gathering system in cubic metres.

Step 3: Emergency Planning and Response Zones

1. Has the EPZ been modified? — YES means the size or shape of the EPZ has been modified to reflect site-specific features of the area or additional information gathered during the planning process.

- The EPA assessor may review the map and the reasoning behind the modification of the planning zone.

NO means there have been no changes made to the calculated EPZ.

2. Has a copy of the CSV batch export file from ERCBH2S been submitted? — YES means the CSV batch export file from ERCBH2S has been submitted as required.

N/A means ERCBH2S was not required to calculate the EPZ (e.g., HVP pipeline, HVP cavern storage facility).

Step 4: Consultation and Notification Requirements

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Have the consultation and notification requirements been met in accordance with Section 4 and Section 13? — YES means that all consultation and notification requirements have been met.

NO means that some or all of the consultation and notification requirements have not been met.

If **NO**, you must attach a detailed explanation of why the consultation and notification requirements were not met, a chronology of the participant involvement program that occurred, and a discussion of the mitigative measures taken. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Are there any ERP-related objections or concerns associated with the *Directive 056* or *Directive 071* application?

YES means there are ERP-related objections or concerns related to the *Directive 056* or *Directive 071* application.

If **YES**, you must provide documentation outlining the concerns or objections raised and any changes or additions that have been made to the ERP to mitigate those concerns or objections. The ERP will go through a full review by an EPA assessor before being deemed technically complete.

NO means there are no known ERP-related objections or concerns associated with the *Directive 056* or *Directive 071* application.

N/A means you have not yet begun the *Directive 056* or *Directive 071* application process.

Step 5: Common Requirements for ERPs

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Does the ERP contain the required content in accordance with Section 5 and Section 14?

YES means the ERP contains all of the required content in accordance with Section 5 and Section 14.

NO means the ERP is missing some of the required content.

If **NO,** you must provide documentation outlining what required content is missing from the ERP and the reasons why it was not included. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Have the public protection measures in Section 5.2 and Section 14.2 been addressed and included in the ERP?

YES means all of the public protection measures in Section 5.2 and Section 14.2 have been met.

NO means the ERP has not addressed some or all of the public protection measures.

If **NO**, you must provide documentation outlining what public protection measures have not been addressed and the reasons why they were not addressed.

3. Have the mapping requirements in Section 5.3 been met?

YES means the mapping requirements in Section 5.3 have been met.

NO means some or all of the mapping requirements in Section 5.3 have not been met.

If **NO**, you must provide documentation outlining what mapping requirements have not been met and why.

4. Is mutual aid required to implement the ERP?

YES means you will require the assistance of mutual aid partners to implement the ERP.

The EPA assessor may review any formal or informal mutual aid agreements included in the ERP, as well as any bridging documents included in the ERP.

NO means you have the required number of staff to implement the ERP.

5. Have communication procedures been established and detailed in accordance with Section 5.8?

YES means the communication procedures are clearly detailed in the ERP.

NO means the communication procedures are either not in the ERP or not complete.

If **NO**, you must provide documentation outlining why the communication procedures are not in the ERP or not complete.

6. Have the roles and responsibilities of emergency response personnel been identified in accordance with Section 5.9?

YES means all the roles and responsibilities of emergency response personnel have been identified in the ERP.

NO means the roles and responsibilities of some responders (e.g., government and service company personnel) have not been identified in the ERP.

If **NO**, you must provide documentation detailing why some of the roles and responsibilities have not been identified in the ERP.

7. Are the personnel trained and capable of carrying out their respective responsibilities?

YES means all responders identified in the plan have been fully trained and are capable of carrying out the role assigned to them within the ERP.

NO means some or all of the responders identified in the plan have not been fully trained and will not be capable of carrying out the role assigned to them within the ERP.

If **NO**, you must provide documentation explaining why the responders identified in the ERP are not trained and capable of filling their respective roles.

Step 6: Requirements for Sour Well Site-specific Drilling and Completion ERPs

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Does the ERP contain the required content in accordance with Section 6 and Section 15?

YES means the ERP contains all of the required content in accordance with Section 6 and Section 15.

NO means the ERP is missing some of the required content.

If **NO**, you must provide documentation outlining what required content is missing from the ERP and the reasons why it was not included. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Will a temporary surface pipeline be used for in-line testing?

YES means the ERP includes plans for the use of a temporary surface pipeline for in-line testing.

The EPA assessor may review the map and any information relating to the temporary surface pipeline.

NO means a temporary surface pipeline for testing of the well will not be used.

3. Will any part of the drilling operation be underbalanced?

YES means that a portion or all of the drilling operation will be underbalanced. You are expected to file the sour well ERP as a nonroutine application and submit a letter to the EPA Section confirming that no sour formation will be encountered while drilling underbalanced and providing details on the start and end dates for the underbalanced drilling operation.

NO means that the well will not be drilled underbalanced.

Step 7: Requirements for Sour Operations ERPs and Supplements

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Does the ERP contain the required content in accordance with Section 7?

YES means the ERP contains all of the required content in accordance with Section 7.

NO means the ERP is missing some of the required content.

If **NO**, you must provide documentation outlining what required content is missing from the ERP and the reasons why it was not included. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Does the supplement contain all the required information in accordance with Section 7.3?

YES means the supplement contains all of the required information in accordance with Section 7.3.

NO means the supplement is missing some of the required information.

If **NO**, you must provide documentation outlining what required information is missing from the supplement and the reasons why it was not included.

N/A means this is an application for a new sour operations ERP.

3. Name and ERP Plan Reference No. of the approved ERP this supplement is linked to

Enter the full name and ERP Plan Reference No. of the approved ERP that this supplement is linked to.

Step 8: Requirements for HVP Pipeline ERPs and Supplements

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Does the ERP contain the required content in accordance with Section 8?

YES means the ERP contains all of the required content in accordance with Section 8.

NO means the ERP is missing some of the required content.

If **NO**, you must provide documentation outlining what required content is missing from the ERP and the reasons why it was not included. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Does the supplement contain all the information in accordance with Section 8.3?

YES means the supplement contains all of the required information in accordance with Section 8.3.

NO means the supplement is missing some of the required information.

If **NO**, you must provide documentation outlining what required information is missing from the supplement and the reasons why it was not included.

N/A means this is an application for a new HVP pipeline ERP.

3. Name and ERP Plan Reference No. of the ERP this supplement is linked to

Enter the full name and ERP Plan Reference No. of the approved ERP that this supplement is linked to.

Step 9: Requirements for HVP Cavern Storage Facility ERPs and Supplements

If you check a **BOLD** *response, the application is nonroutine and you must attach supporting information.*

1. Does the ERP contain the required content in accordance with Section 9?

YES means the ERP contains all of the required content in accordance with Section 9.

NO means the ERP is missing some of the required content.

If **NO**, you must provide documentation outlining what required content is missing from the ERP and the reasons why it was not included. The ERCB will review the circumstances and decide if an exemption is warranted.

2. Does the supplement contain all the required information in accordance with Section 9.3?

YES means the supplement contains all of the required information in accordance with Section 9.3.

NO means the supplement is missing some of the required information.

If **NO**, you must provide documentation outlining what required information is missing from the supplement and the reasons why it was not included.

N/A means this is an application for a new HVP cavern storage facility ERP.

3. Name and ERP Plan Reference No. of the ERP this supplement is linked to

Enter the full name and ERP Plan Reference No. of the approved ERP that this supplement is linked to.

Step 10: Spill Cooperative Membership

1. Are you a member of an oil spill cooperative?

YES means you are a member in good standing of an oil spill cooperative. Enter the name of the cooperative.

NO means you are not currently a member of an oil spill cooperative.

If **NO**, you must have your own response plan and spill response equipment.

The EPA assessor may look at the reasons why you are not a member of a spill cooperative.

Appendix 3 Information Industry Provides to the Public in the EPZ Regarding Exposure to Hydrogen Sulphide

As a minimum, the following information must be provided to the public in the EPZ during the public consultation process.

1) If you are indoors and can smell hydrogen sulphide (H_2S; a pungent rotten egg smell), close all the doors and windows and turn down the furnace thermostat immediately. In the summer, turn off all air conditioning.

2) Contact the nearest Energy Resources Conservation Board (ERCB) Field Centre (see below) and report the H_2S odour. Immediate action will be taken by the ERCB to determine the source of the odour.

3) Monitor the radio or television for explanation and instruction. You may also receive a call from the licensee responsible for the H_2S odour, the local authority, or the ERCB providing further instruction or explanation.

4) If you are considering moving away from the area, contact the licensee representative, the municipality, or the ERCB for evacuation instructions. For major incidents, a special number may be provided and, if so, should be called.

5) If environmental monitoring indicates that the H_2S release may impact members of the public, an evacuation will be carried out under the direction of authorized emergency personnel. Individuals previously identified with special needs will be given top priority.

6) If you are directed to evacuate, follow the instructions that will safely move you away from the H_2S source and out of harm's way. You will also be provided with instructions to check in and register at a reception centre that is located in a secure and safe area.

7) All other individuals should consider leaving the area and should seek medical advice if health symptoms develop.

ERCB Field Centres (telephone number*)

Bonnyville Field Centre	(780-826-5352)
Drayton Valley Field Centre	(780-542-5182)
Grande Prairie Field Centre	(780-538-5138)
High Level Field Centre	(780-926-5399 or 780-538-5138 [24-hour emergency line])
St. Albert Field Centre	(780-460-3800)
Medicine Hat Field Centre	(403-527-3385)
Midnapore Field Centre	(403-297-8303)
Red Deer Field Centre	(403-340-5454)
Wainwright Field Centre	(780-842-7570)

*To call toll free in Alberta, dial 310-0000.

Appendix 4 Assessment Matrix for Classifying Incidents

Table 1. Consequence of Incident

Rank	Category	Example of consequence in category
1	**Minor**	• No worker injuries. • Nil or low media interest. • Liquid release contained on lease. • Gas release impact on lease only.
2	**Moderate**	• First aid treatment required for on-lease worker(s). • Local and possible regional media interest. • Liquid release not contained on lease. • Gas release impact has potential to extend beyond lease.
3	**Major**	• Worker(s) requires hospitalization. • Regional and national media interest. • Liquid release extends beyond lease—not contained. • Gas release impact extends beyond lease—public health/safety could be jeopardized.
4	**Catastrophic**	• Fatality. • National and international media interest. • Liquid release off lease not contained—potential for, or is, impacting water or sensitive terrain. • Gas release impact extends beyond lease—public health/safety jeopardized.

Table 2. Likelihood of incident escalating*

Rank	Descriptor	Description
1	**Unlikely**	The incident is contained or controlled and it is unlikely that the incident will escalate. There is no chance of additional hazards. Ongoing monitoring required.
2	**Moderate**	Control of the incident may have deteriorated but imminent control of the hazard by the licensee is probable. It is unlikely that the incident will further escalate.
3	**Likely**	Imminent and/or intermittent control of the incident is possible. The licensee has the capability of using internal and/or external resources to manage and bring the hazard under control in the near term.
4	**Almost certain or currently occurring**	The incident is uncontrolled and there is little chance that the licensee will be able to bring the hazard under control in the near term. The licensee will require assistance from outside parties to remedy the situation.

* What is the likelihood that the incident will escalate, resulting in an increased exposure to public health, safety, or the environment?

Sum the rank from both of these columns to obtain the risk level and the incident classification

Table 3. Incident Classification

Risk level	Assessment results
Very low 2-3	**Alert**
[redacted]	**Level-1 emergency**
Medium 6	**Level-2 emergency**
[redacted]	**Level-3 emergency**

Table 4. Incident Response

	Incident Classification			
Responses	**Alert**	[redacted]	**Level-2 emergency**	[redacted]
Communications				
Internal	Discretionary, depending on licensee policy.	Notification of off-site management.	Notification of off-site management.	Notification of off-site management.
External public	Courtesy, at licensee discretion.	Mandatory for individuals who have requested notification within the EPZ.	Planned and instructive in accordance with the specific ERP.	Planned and instructive in accordance with the specific ERP.
Media	Reactive, as required.	Reactive, as required.	Proactive media management to local or regional interest.	Proactive media management to national interest.
Government	Reactive, as required. Notify ERCB if public or media is contacted.	Notify local ERCB Field Centre. Call local authority and RHA if public or media is contacted.	Notify local ERCB Field Centre, local authority, and RHA.	Notify local ERCB Field Centre, local authority, and RHA.
Actions				
Internal	On site, as required by licensee.	On site, as required by licensee. Initial response undertaken in accordance with the site-specific or corporate-level ERP.	Predetermined public safety actions are under way. Corporate management team alerted and may be appropriately engaged to support on-scene responders.	Full implementation of incident management system.
External	On site, as required by licensee.	On site, as required by licensee.	Potential for multiagency (operator, municipal, provincial, or federal) response.	Immediate multiagency (operator, municipal, provincial, or federal) response.
Resources				
Internal	Immediate and local. No additional personnel required.	Establish what resources would be required.	Limited supplemental resources or personnel required.	Significant incremental resources required.
External	None.	Begin to establish resources that may be required.	Possible assistance from government agencies and external support services, as required.	Assistance from government agencies and external support services, as required.

Appendix 4 Assessment Matrix for Classifying Incidents

Table 1. Consequence of Incident

Rank	Category	Example of consequence in category
1	Minor	• No worker injuries. • Nil or low media interest. • Liquid release contained on lease. • Gas release impact on lease only.
2	Moderate	• First aid treatment required for on-lease worker(s). • Local and possible regional media interest. • Liquid release not contained on lease. • Gas release impact has potential to extend beyond lease.
3	Major	• Worker(s) requires hospitalization. • Regional and national media interest. • Liquid release extends beyond lease—not contained. • Gas release impact extends beyond lease—public health/safety could be jeopardized.
4	Catastrophic	• Fatality. • National and international media interest. • Liquid release off lease not contained—potential for, or is, impacting water or sensitive terrain. • Gas release impact extends beyond lease—public health/safety jeopardized.

Table 2. Likelihood of incident escalating*

Rank	Descriptor	Description
1	Unlikely	The incident is contained or controlled and it is unlikely that the incident will escalate. There is no chance of additional hazards. Ongoing monitoring required.
2	Moderate	Control of the incident may have deteriorated but imminent control of the hazard by the licensee is probable. It is unlikely that the incident will further escalate.
3	Likely	Imminent and/or intermittent control of the incident is possible. The licensee has the capability of using internal and/or external resources to manage and bring the hazard under control in the near term.
4	Almost certain or currently occurring	The incident is uncontrolled and there is little chance that the licensee will be able to bring the hazard under control in the near term. The licensee will require assistance from outside parties to remedy the situation.

* What is the likelihood that the incident will escalate, resulting in an increased exposure to public health, safety, or the environment?

Sum the rank from both of these columns to obtain the risk level and the incident classification

Table 3. Incident Classification

Risk level	Assessment results
Very low 2-3	Alert
Low **4-5**	Level-1 emergency
Medium 6	Level-2 emergency
High **7-8**	Level-3 emergency

Table 4. Incident Response

	Incident Classification			
Responses	Alert	Level-1 emergency	Level-2 emergency	Level-3 emergency
Communications				
Internal	Discretionary, depending on licensee policy.	Notification of off-site management.	Notification of off-site management.	Notification of off-site management.
External public	Courtesy, at licensee discretion.	Mandatory for individuals who have requested notification within the EPZ.	Planned and instructive in accordance with the specific ERP.	Planned and instructive in accordance with the specific ERP.
Media	Reactive, as required.	Reactive, as required.	Proactive media management to local or regional interest.	Proactive media management to national interest.
Government	Reactive, as required. Notify ERCB if public or media is contacted.	Notify local ERCB Field Centre. Call local authority and RHA if public or media is contacted.	Notify local ERCB Field Centre, local authority, and RHA.	Notify local ERCB Field Centre, local authority, and RHA.
Actions				
Internal	On site, as required by licensee.	On site, as required by licensee. Initial response undertaken in accordance with the site-specific or corporate-level ERP.	Predetermined public safety actions are under way. Corporate management team alerted and may be appropriately engaged to support on-scene responders.	Full implementation of incident management system.
External	On site, as required by licensee.	On site, as required by licensee.	Potential for multiagency (operator, municipal, provincial, or federal) response.	Immediate multiagency (operator, municipal, provincial, or federal) response.
Resources				
Internal	Immediate and local. No additional personnel required.	Establish what resources would be required.	Limited supplemental resources or personnel required.	Significant incremental resources required.
External	None.	Begin to establish resources that may be required.	Possible assistance from government agencies and external support services, as required.	Assistance from government agencies and external support services, as required.

Appendix 5 Distribution of an Approved ERP

Distribute your approved ERP to the ERCB and government agencies in Alberta as follows:

1) ERCB Field Centre—1 copy

   ERCB EPA Section—1 copy

   Only the ERCB copies should contain confidential resident information. Copies to other agencies and individuals must not contain confidential resident information.

2) Municipal government (includes city, town, village, summer village, municipal district, county, special area, national park, Indian reserve, and Métis settlement)—1 copy

   An ERP is only sent to a town or city if its boundary falls into the EPZ or is in very close proximity (for example, 1 km beyond the EPZ). If this is not the case, the ERP should be sent to the appropriate municipal district or county.

3) Regional health authority—1 copy

   Send the ERP to the appropriate RHA, directed to the Manager/Director of Environmental Health. Send a copy to Health Canada if a First Nations Reserve is included in the ERP.

4) Alberta Employment and Immigration, Workplace Health and Safety Compliance—1 copy

   A copy should be sent to either the Northern or Southern Regional Office to the attention of the

Team Leader Alberta Employment and Immigration Workplace Health and Safety Compliance Southern Regional Office 600 Guinness House, Elveden Centre 600, 272 – 7 Avenue SW Calgary AB T2P 0Z5	or	Team Leader Alberta Employment and Immigration Workplace Health and Safety Compliance Northern Regional Office 10th Floor, South Tower Seventh Street Plaza 100030 – 107 Street Edmonton AB T5J 3E4

5) Royal Canadian Mounted Police—Consult with local RCMP to determine if a copy is required.

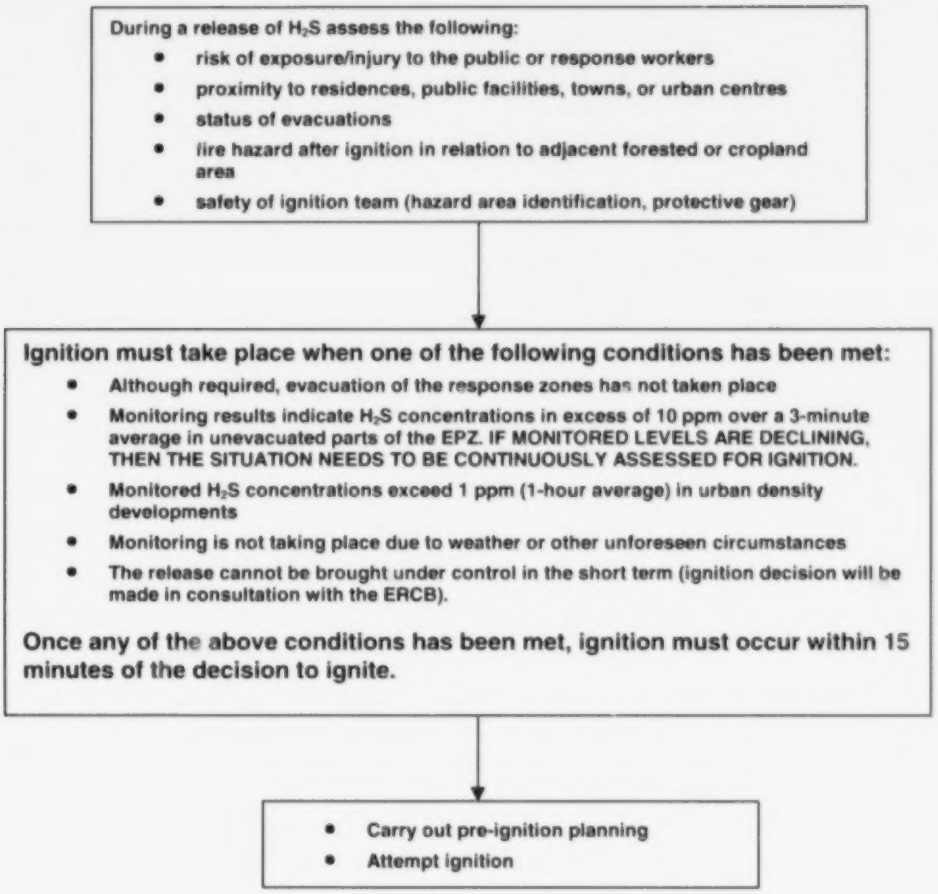
Appendix 6 Evacuation Requirements

H_2S concentrations in unevacuated areas	Requirement
1 to 10 ppm (3-minute average)	Individuals who requested notification so that they can voluntarily evacuate before any exposure to H_2S must be notified.
Above 10 ppm (3-minute average)*	Local conditions must be assessed and all persons must be advised to evacuate and/or shelter.

* If monitored levels over the 3-minute interval are declining (i.e., three readings show a decline from 15 ppm to 10 ppm to 8 ppm over 3 minutes), evacuation may not be necessary even though the average over the 3 minute interval would be 11 ppm. Licensees should use proper judgement in determining if evacuation is required.

SO_2 concentrations in unevacuated areas	Requirement
5 ppm (15-minute average) 1 ppm (3-hour average) 0.3 ppm (24-hour average)	Immediate evacuation of the area must take place.

Appendix 7 Assessment and Ignition Criteria Flowchart



Appendix 8 Information Disseminated to the Public at the Onset of and During an Incident

To the affected public—at the onset	To the affected public—during
• type and status of the incident • location and proximity of the incident to people in the vicinity • public protection measures to follow, evacuation instructions, and any other emergency response measures to consider • actions being taken to respond to the situation, including anticipated time period • contacts for additional information	• description of the products involved and their short-term and long-term effects • effects the incident may have on people in the vicinity • areas impacted by the incident • actions the affected public should take if they experience adverse effects

To the general public—during
• type and status of the incident • location of the incident • areas impacted by the incident • description of the products involved • contacts for additional information • actions being taken to respond to the situation, including anticipated time period

Appendix 9 First Call Communication Form

ERCB Energy Resources Conservation Board

First Call Communication

CONTACT DETAILS

ERCB Contact			Field Centre	
Caller*			**Phone***	
Notification* **date*** **time***	**Release** **start date*** **start time***		**end time***	☐ Ongoing
Licensee			Phone	
Location*		Nearest Town		
Nearest Resident	Distance/Direction		Phone	
Media Involvement?* ☐ **Local** ☐ **Regional**	☐ **National** ☐ **International**	Media Contact		
Operator			Phone	

PUBLIC IMPACT

Public Health and Safety* ☐ **could be jeopardized** ☐ **is jeopardized**		**Worker Injuries***	☐ **First aid** ☐ **Hospitalization**	☐ **Fatality**
Emergency Assessment Matrix completed with licensee*	☐ **Alert** ☐ **Two** ☐ **One** ☐ **Three**	ERP activated?	☐ Site Specific ☐ Field/Area	☐ Corporate
EPZ Size (2 km if unknown)	Numbers and Types of Public in EPZ		EOC/ICP Location	
Public Protection Measure Implemented	☐ Notification ☐ Shelter	☐ Roadblocks ☐ Evacuation	Number Evacuated	

RELEASE TYPE

Release Impact* ☐ **On lease**	☐ **Off lease**	**H_2S Concentration***		
☐ **Sensitive Environment***	**Environment Affected***	☐ **Air** ☐ **Land**	☐ **Standing Water** ☐ **Flowing Water**	Water Body Name
Area Affected (m^2)*	☐ **Property Damage***	☐ **Equipment Loss***	☐ **Wildlife/Livestock Affected***	
Gas Release ☐ Sweet	☐ Sour		Volume/Rate	
Liquid Release ☐ Oil	☐ Water	☐ Effluent	Volume/Rate	
☐ Release Point Determined				

CONTAINMENT

Third Party /Outside Assistance Required*	☐ **Incident contained or controlled** ☐ **Intermittent control possible**		☐ **Imminent control probable** ☐ **Incident is uncontrolled**
Company		WCSS Co-op	

* These fields must be completed to generate an FIS number and/or to complete an Emergency Assessment Matrix

Revised Mar 31/08

(continued)

OPERATION TYPE

Well Licence No.		Type of Incident	☐ Kick	☐ Blowout	☐ Loss of Circulation
Well Status	☐ Drilling ☐ Standing	☐ Servicing ☐ Sweet	☐ Producing ☐ Sour	☐ Injection ☐ Critical	☐ Suspended
Pipeline Licence No.		Line No.	☐ Hit	☐ Leak	☐ Rupture
Production Facility Licence No.		☐ Gas ☐ Oil	☐ Gas Plant ☐ Battery	☐ Compressor ☐ Other	AENV Approval No.

AIR MONITORING

☐ Licensee Air Monitoring Occuring		☐ Mobile	☐ Handheld	Estimated Time of Arrival
Initial Readings/Location		☐ PPB ☐ PPM	☐ On Site ☐ Off Site	Distance
Contractor Name		Phone		AMU Phone
Wind	Direction Speed	Meteorological conditions		ERCB AMU ETA

COMMUNICATIONS

Communications completed by Licensee and/or ERCB

☐ EMA	☐ Health Region	☐ NEB	☐ TDG	☐ Fire	☐ WCSS
☐ AENV	☐ AHW	☐ DFO	☐ First Nations	☐ RCMP/Police	☐ Other
☐ WH&S	☐ Local Authority	☐ Environment Canada	☐ Indian Oil and Gas	☐ Ambulance	

Contact names and phone numbers:

Incident Cause	☐ Natural	☐ Human-Induced Unintentional	☐ Human-Induced Intentional

OTHER INFORMATION

☐ First Nations Band ☐ Metis Settlement	Band/Settlement Name/Contact			Phone
Complaints	☐ Local ☐ Large area			
Private Land Title Holder				Phone
Public Land Type	☐ Irrigation	☐ Forestry	☐ Grazing	☐ Other
Public Land Administrator Contact				Phone

Additonal Information

Appendix 10 Summary of Changes in November 2008 Edition of *Directive 071*

New and revised text is underlined below. Text that has been removed is crossed out.

PART A

Section 1: Introduction	• Section 1.8: Continuous Improvement is new.
Section 2: Corporate-level ERPs	• Section 2.1, Requirement 4 The licensee must ensure that its 24-hour emergency telephone number is posted by way of a conspicuous sign erected at the primary entrance to all licensee wells and facilities.
Section 3: Emergency Planning and Response Zones	• Section 3.3, second paragraph Operators are strongly encouraged to use the table in Appendix 10 of the draft *CAPP Companion Planning Guide to ERCB Directive 071* or an appropriate dispersion model to determine the EPZ size for a pipeline release of HVP product. The EPZ for an HVP facility is calculated using the EPZ for the largest pipeline entering or leaving the facility measured from the facility inlet. • Section 3.4.2 The EAZ for an HVP product release is ~~the~~ an area outside of the EPZ~~, from the edge of the calculated EPZ radius to 1.5 times the calculated EPZ radius~~. The EAZ outer boundary is 1.5 times the calculated EPZ radius measured from the well, pipeline, or facility.
Section 5: Common Requirements for ERPs	• "Site-specific" has been removed from the section title. • Section 5.1, Requirement 1 The licensee must include all the information in Appendix 4 in its ~~site-specific~~ ERP. • Section 5.2, first sentence ~~Site-specific~~ ERPs address key roles and responsibilities of responders to protect the public during emergency situations.
Section 6: Sour Well Site-specific Drilling and/or Completion ERPs	• A new paragraph has been inserted below the Section 6.8 title.
Section 7: Sour Operations ERPs	• Section 7.3.1, first paragraph If a licensee intends to drill and/or complete a noncritical or critical sour well and the entire proposed sour well EPZ is included within the licensee's sour operations ERP emergency planning zone, the licensee may submit a supplement for approval of those operations in place of a new sour well site-specific drilling and/or completion ERP. • Section 7.3.1, second paragraph A new sour well site-specific drilling and/or completion ERP is required if the proposed well EPZ is not entirely within the sour operations ERP emergency planning zone. • A new requirement has been added after Section 7.3.1, Requirement 7.

PART B

Section 11: Corporate-level ERPs	• Section 11.1, Requirement 1 If an ~~site-specific~~ ERP is not required, the licensee must have an up-to-date copy of the corporate-level ERP (hard copy or electronic) available at a response location(s) in its area of operations.

Section 13: Public and Local Authority Involvement in Emergency Preparedness and Response

- Table 8, public awareness program
  Consultation is required ~~once~~ every two years with members of the public within a sour operations, HVP pipeline, or cavern storage facility EPZ through consultative processes ~~by way of a public meeting~~ to promote continued awareness of emergency response procedures and to address any concerns.
- Section 13.2 has been removed from *Directive 071* and its contents have been incorporated into Section 14.6: Plan Management Process.

Section 14: Common Requirements for ERPs

- "Site-specific" has been removed from the section title.
- Section 14.1, Requirement 1
  The licensee must have an up-to-date copy of the ~~site-specific~~ ERP (hard copy or electronic) at a response location(s) in its area of operations.
- Section 14.3, Figure 4, ignition component, third bullet in the first box
  H_2S concentrations in excess of 1 ppm (1-hour average) detected in urban density developments.
- The title of Section 14.6 has been changed from "Plan Maintenance" to "Plan Management Process."
- The following has been removed from the first paragraph below the Section 14.6 title and inserted with some wording changes after Requirement 25:

  ~~After approval~~, The licensee is expected to update its approved site-specific drilling and/or completion ERPs with information about on- and off-site emergency response team personnel prior to commencing drilling operations.

  The licensee ~~is also expected to~~ may have to update the ERP ~~prior to issuing a notice of public hearing~~ if the ERCB determines that an update is required.
- Section 14.6, second paragraph
  The ERCB no longer requires the submission of annual ERP updates for approval ~~for sour operations ERPS~~, but it is checking ERP accuracy continually using its ER Assessment Program. ERPs that are not current and therefore could result in ineffective emergency response will be subject to enforcement action by the ~~Public Safety/Field Surveillance Branch~~ ERCB.
- Section 14.6, Requirement 22
  ~~Although there is no requirement for annual ERP updates,~~ The licensee must demonstrate that its plan management process keeps ERPs up to date ~~as changes are identified~~. A plan management process ensures that
  - plans are reviewed and updated on a semiannual basis, if necessary, with changes made to ensure that the information remains accurate; updates could be triggered by some or all of the following:
    - changes to ~~company~~ current emergency information,
    - new mapping information—a small map of the affected area showing the changes would be acceptable for a period of one year,
    - new resident information,
    - any changes to response staff information or response capabilities, and
    - facility additions such as well or pipeline tie-ins that do not require submission of a supplement;
  - residents are contacted to update their information; and
  - ground truthing identifies any changes, such as new residents, businesses, and renters, and verifies the ERP maps—the licensee may use any method for ground truthing.

- Section 14.6, Requirement 23 is new. The previously numbered Requirements 23 and 24 have been renumbered 24 and 25.
- A new paragraph has been added after Requirement 23.

Appendices

- Appendix 1—The term "consultative processes" has been added.
- Appendix 2, ERP Application Form

  Step 1—"ERP Plan Reference No." changed to "DDS ERP Plan Reference No."

  "Registration Date" changed to "Submission Date."

  Step 2—"Critical," "Noncritical," and "N/A" checkboxes added.

  New wording and arrangement of checkboxes.

  Supplement types added.

  "Replacing an existing ERP" and "Previous ERP name" added.

  Step 4—Are there any ERP-related objections or concerns with the *Directive 056* or *Directive 071* application?

  Step 5—COMMON REQUIREMENTS FOR ~~SITE-SPECIFIC~~ ERPS

  Step 6—A new question has been added: "Will any part of the drilling operation be underbalanced?"

- Appendix 2, How to Complete the ERP Approval Application
  This section has been updated with the same changes as the ERP Application Form.

  Step 2—Type of ERP: If you check a **BOLD** response, the application is nonroutine. For each application, you must indicate whether it is critical, noncritical, or not applicable.

  Replacing an existing ERP: Check this box if this ERP is replacing an existing ERP and also enter the previous ERP name.

  Step 4—Are there any ERP-related objections or concerns associated with the *Directive 056* or *Directive 071* application? **YES** means there are ERP-related objections or concerns related to the ERCB *Directive 056* or *Directive 071* application.

  Step 6—Will any part of the drilling operation be underbalanced?
  YES means that a portion or all of the drilling operation will be underbalanced. You are expected to file the sour well ERP as a nonroutine application and submit a letter to the EPA Section confirming that no sour formation will be encountered while drilling underbalanced and providing details on the start and end dates for the underbalanced drilling operation.

  NO means that the well will not be drilled underbalanced.

- Appendix 7—Monitored H_2S concentrations exceed 1 ppm (1-hour average) in urban density developments.